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THE IDENTIFICATION OF DATA ELEMENTS IN BIBLIOGRAPHIC RECORDS

Ann T. Curran and Henriette D. Avram

Final Report of the Special Project on Data Elements for the Subcommittee on Machine Input Records (SC-2) of the Sectional Committee on Library Work and Documentation (Z-39) of the United States of America Standards Institute

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FOREWORD

In June of 1966 the Chairman of Subcommittee 2: Machine Input Records of USASI/Z-39 presented a proposal for research study designed to develop data to serve as a basis for standardization of machine input bibliographic records. The proposal was to be carried out in a short time by a qualified specialist giving full time to the work. Funds to carry out the proposed research were provided jointly by the National Science Foundation and The Council on Library Resources. The funds were assigned to Z39, at the University of North Carolina for administration, and the Subcommittee 2 Chairman, Mrs. Henriette D. Avram was designated the Principal Investigator. The members of Subcommittee 2 at this time are:

Mr. Kay Guiles, Secretary
Mrs. Pauline A. Atherton
Mr. Lawrence Buckland
Mr. Frederick Kilgour
Mr. Abraham Lebowitz
Miss Ann T. Curran
Mrs. Henriette D. Avram, Chairman

Miss Ann T. Curran was enlisted to carry out the investigation, beginning in September and to complete her work by the end of March 1967. This report is thus fundamentally an individual product, though Miss Curran has had the continuing advice of the Subcommittee, the specific counsel of many contributors to her bank of data, and the supervisory direction of Mrs. Avram.

My own concern, as Chairman of USASI/Z-39, has been and remains the heavy burden of responsibility we all have for moving forward in the speediest manner compatible with sound practice our basic groundwork for bringing the enormous capacities of the new computer technology to bear upon the management of libraries and library resources. This report should serve as a useful guide to any large-scale effort in its field. Depending upon its utility, it may lead more swiftly than would otherwise be possible to the development of one or more national standards to be developed by the Subcommittee on Machine Input Records.

Jerrold Orne, Chairman
USASI/Z-39
University of North Carolina

ACKNOWLEDGEMENT

The authors wish to acknowledge the assistance of Mrs. Suzanne Gray who worked as part-time Research Assistant for the project and to echo Mr. Orne's recognition of the many who contributed to the study. The institutions visited and the persons interviewed are listed in Appendix A. Many others contributed information about their mechanized systems through the open literature, through unpublished descriptions of their systems, and through correspondence and telephone communications.

We are also indebted to Miss Laura Colvin, and Miss Mary Kinney, of Simmons College, School of Library Science, who took time from their teaching schedule to consult with the Research Associate during the course of this study.

Henriette D. Avram, Principal Investigator
Ann T. Curran, Research Associate

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INTRODUCTION

In recent years, work on information systems has created an interest in the concept of national networks for the exchange of data. The basic premise that such networks would allow us to share the results of intellectual activity and minimize costs incurred is a valid one. The implementation of such networks, however, includes a complexity of difficulties. Not least among them, but basic for any measure of success, is the necessity to agree on standards for the identification, representation, and recording of information. The Subcommittee on Machine Input Records (SC-2) of the Sectional Committee on Library Work and Documentation (Z-39) of the United States of America Standards Institute has been established to develop such standards. Until the producers and users of such information can agree on a set of standards for the identification, representation, and recording of bibliographic and textual data elements, advancement toward national network systems will be retarded; in fact, perhaps made impossible except for inefficient prototypes.

The objective of the Subcommittee on Machine Input Records is the development of standards for identifying and recording bibliographic and textual elements to be used in machine readable data systems in libraries and related institutions, and organizations producing information used in such institutions. The purpose of the Special Project on Data Elements is to provide the Subcommittee with background information that will be helpful to them in determining which data elements should be tagged (identified) in machine readable records. It should be emphasized that the primary purpose of this report is to serve as a working tool for the members of Subcommittee on Machine Input Records. It is not a standard nor is its intent to present recommendations for a standard.

The broad scope of SC-2 has made for a very interesting study but has presented problems during the course of the study. What seemed rather straightforward in the formulation stages has proved much more difficult as the study progressed. Early in the study the question had to be answered, "should this project be concerned with the data elements in the work itself or in the record for the work?" The decision was made that the scope of SC-2 implies the responsibility for the standardization of data elements in a record rather than in a work. This report, therefore, follows this guideline.

The investigators also had to decide whether the data elements should be the totality of the elements included in records or just the elements that should be separately tagged in a machine record. Reflecting upon the original discussions that led to the project, it seemed that SC-2 has to see displayed all the elements that can be included in records before decisions can be made as to which elements need to be tagged.

To cover bibliographic records for all publication forms for a variety of uses is indeed a formidable task. The traditional library emphasizes the special features of the bibliographic package. Abstracting services and information centers emphasize the subject analysis of the work. Since the scope of SC-2 is not limited to a particular set of data elements nor to the practices of a particular processor, this study extended itself to the data elements that describe the subject content of the work, as well as those that describe the work bibliographically. Although SC-2 hopes to cover all publication forms, this study had to limit itself, because of the time available, to the major forms -- books, serials, journal articles, technical reports and conference proceedings.

The unbounded character of this study caused by the unbounded scope of SC-2 has produced difficulties in finding a satisfactory scheme to represent meaningfully the data gathered. It was originally planned to present the results of the study as a matrix with three dimensions, x, y, & z. The data elements would be represented along the x axis, the uses along the y axis, and the publication forms along the z axis. A number of problems were encountered in trying to plot this matrix. First, what is meant by use, a product (catalog cards, abstracts, etc.) or a system (circulation systems, serials check-in system, etc.)? If we restrict ourselves to products rather than systems, we exclude a number of data elements that must be included in a system but do not appear in any product. For example, the language of the title may be included in the system but does not appear on a catalog card.

Second, although there is some standardization in the elements included on a catalog card, the elements included in other products are not standardized. All serials holdings lists do not include the same set of elements, nor do accessions lists or abstract journal citations. What elements should be plotted for such products? Those found in all examples of the product examined? Those found in any example examined? Those usually found? What constitutes "usually"?

After abandoning the idea of representing elements vs. products or use, an attempt was made to plot elements vs. bibliographic forms. Here again problems were encountered. The data elements that may be included in records for a particular bibliographic form are not standardized. For example, the author's affiliation is not included in the conventional catalog record for a book,but it may be included in an abstract journal's record for a book.

Because the inexact nature of elements vs. bibliographic form and elements vs. use did not lend itself to plotting, the final decision was to give a total list of elements that may be included in bibliographic records for books, serials, journal articles and technical reports, without any indication of bibliographic form or use. It is hoped that this will give the subcommittee something with which to start. Later on, as the goals and plans of SC-2 become better defined and refined, supplementary representations may be prepared from the vast amount of information gathered during this study.

An attempt has been made, however, to cover the special considerations of different uses and different forms in the text portions of this report. To supplement the total list of elements, text sections, giving the reasons why tagging particular elements may be required,are included.

In some respects this is a very good time to be standardizing machine input records. Libraries are just in the initial stage of automation. Large files have not yet been converted to machine-readable form,but some experience has been gained in data processing. Catalog cards and book catalogs have been made, and there are a number of mechanized acquisition, circulation, and serial check-in systems in operation around the country. Although there may be differences in opinion as to what data elements should or should not be included in such products or systems, the coding requirements can be determined without a great deal of difficulty.

This is, however, a very critical time in library automation. No one knows how bibliographic information should be identified and organized for the most efficient use in a total machine system. There is very little experience with on-line processing or inquiry. In an on-line system, one would expect the machine to be an active partner in any search. Who knows at this time how this should be done, how the data should be tagged, how files should be structured, what the search strategies or machine responses should be?

Parallel to the problem of predicting the future is the concurrent one of maintaining continuity with the past. What implications does this have for SC-2? Should standards reflect only the requirements of today,or should they also reflect some consideration of the future?

There is also the possibility that bibliographic description may change somewhat in the future. Present cataloging rules and practice reflect not only the inherent needs in describing different materials and making them accessible, but also the techniques available at the time. Existing cataloging rules and practice have been influenced by the means for displaying the information, the unit card and the unit abstract entry. All the cataloging information is displayed, and it is displayed in a prescribed order. In a mechanized system, it need not be. Data elements can be included or excluded, arranged or ordered in a variety of ways depending on the need or desire of the user. In summary, we are at the brink of a new era; change is to be expected. What are the implications for standardization?

Comments on this report are invited and should be directed to the Chairman of the Subcommittee on Machine Input Records:

Mrs. Henriette D. Avram
Information Systems Office
Library of Congress
Washington, D. C. 20540

I. DATA ELEMENTS - CONVENTIONAL REPRESENTATION

After the project had accumulated the hundreds of data elements that can be associated with the forms studied — books, serials, journal articles, technical reports, and conference proceedings — the decision had to be made as to how these hundreds of elements should be organized into a total list. Alphabetical arrangement was decided against because it seemed that in a list as long as this, some sort of grouping or ordering of the elements would give a more comprehensible representation.

The grouping of conventional cataloging, i.e. main entry, title statement, author statement, etc., was considered. With much hesitation and reluctance it was finally decided to organize the elements conventionnally into entries, statements, and notes. This scheme is also used in presenting the reasons for tagging the separate elements in Section II. Considering the broad objectives of SC-2, legitimate objections can be taken to organizing the elements according to a scheme used by one particular producer, the library, for one particular record, the catalog. Also, upon close examination, it can be seen that the scheme does not accommodate the catalog records of all bibliographic forms with equal ease, but that it is definitely slanted toward the book. Furthermore, as can be seen in the large accumulation of elements under notes, it does not accommodate effectively the records of other processors such as abstracting services and information centers. To compensate for this very narrow view of the bibliographic world, a more generalized treatment is given in Section VIII.

The elements listed in this section are elements of general interest. Elements of local interest such as dates ordered, received, etc., are given in Section IX.

Entries (Main or Added)

- Personal author entries
  - Surname
  - Forenames or initials
  - Designation
    - Number (Sovereigns, Popes)
    - Rank
      - Titles preceding forename
      - Titles following forename
        - Country of sovereign
    - Other
  - Dates
    - Birth
    - Death
    - Flourished
  - Relator
    - Editor
    - Compiler
    - Translator
    - Illustrator
    - etc.
  - Type
    - Surname entry
    - Forename entry
      - Saint
      - Pope
      - Sovereign
      - Prince or nobleman
      - Pseudonym
  - Index annotation (notation of content in an index entry)
- Corporate author entries
  - Name
    - Main body
    - Subdivision
  - Code
  - Designation
    - Name of local place, country, state or province
    - Name of institution
    - Dates
    - Other identifiers
    - Number
  - Type
    - Place name
    - Firm name

    - Conference
    - Uniform heading
    - Government body
    - Society or institution
    - etc.
  - Index annotation
- Title entries
- Uniform title entries
  - Title
  - Language of work
  - Designation
- Series entries
  - Title
  - Author-title
    - Author
      - Personal name
      - Corporate name
    - Title
  - Number
    - Report numbers
      - Originating agency
      - Military sponsor
      - Secondary
      - Document serial
    - Agency accession number
    - Superintendent of Documents number
    - British National Bibliography number
    - Library of Congress card number
    - Registration number
    - Luhn number
  - Subseries
    - Title
    - Author - title
      - Author
      - Title
    - Number
  - Index annotation
- Author-title entries
  - Author
    - Personal name
    - Corporate name
  - Title
- Subject entries
  - Main term
    - Type
      - General subject
      - Geographic name
      - Provisional term (not yet established)
      - Uniform title
      - Personal name
      - Corporate name

- Author-Title
  - Author
    - Personal name
    - Corporate name
  - Title
- Subdivisions
  - Type
    - Subject
    - Geographic name
    - Form
    - Time
- Authority
  - Library of Congress
  - National Library of Medicine
  - etc.
- Security classification of term
- Level of term
- Weight of term
- Index annotation
- Descriptive phrase (index annotation for particular subject term)

Classification number or subject category

- Authority
  - Library of Congress
  - National Library of Medicine
  - COSATI
  - NASA
  - etc.

Statements

- Title statement
  - Title
    - Main part (added entry portion)
    - Subtitle
  - Language of title
  - Security classification of title
  - Translation of title (by processor)
    - Language of translation
  - Other language titles on piece
    - Language
  - Transliteration of title
    - Alphabet of original
    - Alphabet of transliteration
  - Conventional title
  - Modified title of serial (that appears with corporate entry)
  - ASA abbreviation of title
  - Other abbreviations
  - CODEN
- Author statement
- Affiliation statement
  - Name
    - Main body
    - Subdivision(s)

- Location
  - City
  - State
  - Country
- Edition statement
  - Edition information
  - Remainder of statement
  - Edition number
  - Revised
  - Enlarged
  - Abridged
  - Limited
  - Critical
  - First issue
  - Later issue
  - No issue number
- Holdings Statement
  - Initial volume number(s) published
  - Initial issue number(s) published
  - Initial edition number published
  - Initial month(s) published
  - Initial season(s) published
  - Initial day published
  - Initial year(s) published
  - Terminal volume number(s) published
  - Terminal issue number(s) published
  - Terminal edition number published
  - Terminal month(s) published
  - Terminal season published
  - Terminal day published
  - Terminal year published
- Imprint statement
  - Place published
    - Street
    - City
    - State
    - Country
    - Code
  - Publisher
    - Name
    - Code
    - Type
      - Original
      - Reprint
      - Distributor
      - Microform edition source
      - Claims source
      - Back issues source
  - Date
    - Day
    - Month
    - Year

- Type
  - Imprint
  - Issued or published
  - Initial
  - Terminal
  - Revised
  - Copyright
  - Original
  - Reprint
  - Manuscript received
  - of work done
  - of degree (theses)

- Collation statement
  - Preliminary pagination
  - Beginning page number
  - Ending page number
  - Number of pages
  - Number of linear feet
  - Number of reels
  - Number of cards
  - Number of sheets
  - Number of containers
  - Number of boxes
  - Number of bibliographical volumes
  - Number of physical volumes
  - Negative
  - Color (of binding)
  - Tabloid
  - Looseleaf
  - Mimeograph
  - Height
  - Width
  - Thickness
  - Illustration statement
    - Atlases
    - Charts
    - Coats of arms
    - Decorations
    - Diagrams
    - Facsimiles
    - Forms
    - Genealogical tables
    - Illustrations
    - Maps
    - Music
    - Phonodisc
    - Plans
    - Plates
    - Portraits
    - If colored
    - Number of
    - If in pockets

Series statement*

---

*See Series entries p. I-3 for the internal tagging required when the input for the series statement is used to generate series entries.

Notes

- Title
  - Minor variations
- Subtitle
- Authorship
  - Editor(s)
  - Issuing bodies
  - Sponsoring agencies
    - Contract number
    - Project number
    - Project name
    - Task number
  - Official organ of
- Edition
- Imprint
  - Place published
  - Publisher
  - Date
    - Report year if not calendar
    - Duration of publication
    - Suspension of publication
    - No more published?
- Collation
  - Pertaining to the work
  - Pertaining to the copy
- Scope of work
- Publisher's annotation
- Related works
  - Predecessors
    - Continues
    - Supersedes
    - Absorbed
  - Successors
    - Continued by
    - Superseded by
    - Absorbed by
  - Sequels
  - Revisions
  - Other language editions
    - Cover-to-cover translation of
    - If has a cover-to-cover translation
  - Commentaries
  - Criticisms
  - Concordances

- Abridgements
- Adaptations
- Dramatizations
- Novelizations
- Parodies
- Supplements
  - Number of supplements/year
  - If supplement is in normal numbering sequence
  - If separate or in issue
  - If treated as a separate title
  - Months supplements regularly published
- Special numbers
- Indexes
  - If has an index
  - If index separate or in issue
  - If separate, free or purchased
  - Price of index
  - If separate and free, request each index
  - If separate, treated as a separate title
  - In (or with) last issue of volume
  - In (or with) first issue of next volume
  - Month index is issued
  - If cumulative index, dates and volumes covered
  - If cumulative index, type (author, subject, etc.)

Numbering
- Issues/volume
- Issues/year
- Issues/month
- If issue numbering is continuous, repeats each volume, or repeats each year
- Volumes/year
- Issue number of volume change
- Month of volume change
- Increment by which volume numbering advances

Frequency
- Statement
- Code
- Months of year published
- Weeks of month published
- Weeks of year published
- Date of month published
- Day of week published
- Exceptions to daily frequency
- Number of days between issue dates
- If predictable
- If published at equal intervals

Issue Designation
- Series
- Volume number
- Issue number
- Part number
- Supplement number

- Month(s)
- Season
- Day
- Year(s)

Thesis
- Degree
- Date
- Institution
- Subject department

Conference
- Name
- Place held
- Date held
- Sponsor

At head of title

Bound with

Title romanized

Language(s)
- Code(s)
- Of original edition
- Of student
- Of summaries

Security classification
- Of document
- Of entry
- Group number

Project or non-project work

Copyright
- Holder
- Status

Form, bibliographic and physical
- Book (or Monograph)
  - Dictionary
  - Encyclopedia
  - Textbook
  - etc.
- Technical report
  - Final
  - Progress
  - Topical
- Serial
  - Periodical
  - Series
  - Abstracting or indexing journal
  - etc.
- Journal article
- Conference proceedings
- Conference paper
- Festschrift
- Thesis
- Government document
  - City
  - State

        - County
        - Country
        - U.N.
    - Patent
    - Translation
    - Map
    - Engineering material list
    - Engineering drawing
    - Photograph
    - Print
    - Poster
    - Art reproduction
    - Motion picture
    - Films
    - Filmstrip
    - Slide
    - Recorded sound
        - Disc
        - Cylinder
        - Tape
        - Wire
    - Manuscript
    - Correspondence
    - Large print
    - Microfilm
    - Microfiche
    - Microcard
    - Microprint
    - Hard cover binding
    - Music
    - Miniature score
    - Braille
    - Punched card
    - Punched paper tape
    - Magnetic tape
    - Magnetic disks
- Supplementary note
- Availability and price
    - Price
        - Currency of price quotation
        - Edition (e.g., microfilm) of price quotation
        - Period of price quotation (1 year, 1 volume, multi-years or issue)
    - Publisher's subscription policy
        - No "less than 1 yr." subscriptions
        - No "less than 6 mos." subscriptions
        - Full years only
        - Calendar years only
        - By volume only
        - Through membership only
    - Payable by subscription or billed
    - Availability for exchange

- Type of work
  - Review
    - Critical
    - Non-critical
  - Experimental
  - Theoretical
  - Original research
  - Proposal
  - History
  - Clinical study
  - etc.
- Level of approach
  - Popular
  - Juvenile
  - Layman
  - Young adult
  - Professional in subject area
  - Professional in another subject area
  - Graduate student
  - Senior
  - etc.
- Evaluation of content
  - Rating (3 star, 4 star)
  - User comment
  - How often cited
  - How often borrowed or xeroxed
  - Circulation of a periodical
- Contents (Features)
  - Abstracts
  - Advertising
  - Bibliography
    - Type
      - References
      - Suggested reading
      - Survey of literature
      - General
      - Primary
      - Secondary
    - Location
      - Pagination
      - End of text
      - End of chapter
      - As footnotes
    - Number of references
  - Biographical information
  - Book reviews
  - Calendars of forthcoming meetings
  - Programs of forthcoming meetings
  - Patent lists
  - Exercises (problems, etc.)
  - Film reviews
  - Glossary
  - Indexes

  - Inscriptions
  - News
  - Play reviews
  - Statistics
  - Symbol definitions
  - Trade literature (new products, etc.)
  - Appendices
  - Reprints
  - Errata sheet
- Contents (Text)
  - Preface
  - Introduction
  - Table of contents
    - Authors
    - Titles
    - Pagination
  - Abstract
  - Summary or conclusion
  - Headings
  - Figure captions
  - Table footnotes
  - Mathematical equations
  - Footnotes
    - Type of work cited
    - Elements of work cited
    - Notes
  - Bibliography
    - Type of work cited
    - Elements of work cited
    - Notes
  - Index

II. IDENTIFICATION OF ELEMENTS

A human being can visually examine a record such as a catalog card, categorize the data on it by type (e.g.,author, title, publisher, etc.) and recognize the beginning and end of each type of data on the card. As yet, no way has been found to do this automatically. If the computer is to manipulate a particular type of data within a record, it is necessary to manually identify the types of data within the record by some tagging scheme which indicates where each type of data begins and ends in the record.

Given the need to identify the various parts of the record, one immediately is faced with the question, "What should be separately identified?" "To what depth?"

Some of the reasons for tagging are:

1. To select (or exclude) certain data elements at output time. For example, only author, title, and call number may be desired on an overdue notice,whereas author, title, call number and imprint may be desired on a "new accessions" list.

2. To order, arrange, or sequence the elements as desired in the particular product. Some abstracting and announcing services prefer title to be listed before author, whereas others prefer author before title. Also, there is much variety in abstracting and indexing services in the sequencing of the components of a journal article citation - volume number, issue number, page number, and date. Separate identification of each part allows for a variety of output arrangements.

3. To allow for various type fonts(boldface, italics, etc.) in automatic typesetting.

4. To prepare special indexes to the records (author, subject, etc.) or special arrangements of the records (by author, subject term, subject classification, language, date, etc.)

5. To subarrange identical filing entries by an element; e.g., subarranging an author's works by title.

6. To edit input data, e.g., performing validity checks on certain types of data or testing the presence or absence of a particular element in a record.

7. To isolate an element which may be subject to change after the original record has been created. Serial publications for example, are apt to change publishers, place published, numbering, frequency, etc. Separate identification of these elements and characteristics allows for changing the smallest amount of data, e.g., the place published rather than entire imprint statement.

The reasons above pertain chiefly to making various products from machine records. How data should be broken down and tagged in an on-line system so that they may be effectively worked upon, grouped and presented to the inquirer is a question which only experience with such systems can answer.

Reasons for tagging individual elements in a record are given in the following pages.

Entries

In a multiple approach catalog, one entry is as good as another in locating a work, and the designation of entries as being main or added serves little purpose other than indicating the cataloger's decision as to who is primarily responsible for the work. In a single entry listing, however,the desire is to place the entry where it is most apt to be sought. There is, therefore, a need to indicate which entry this is when there is more than one. Also, in a bibliographic citation, there is a need to indicate which name should appear first in the citation, so again a choice has to be made among entries. The comments which follow pertain to the type of entry regardless of whether it is a main entry, or an added entry.

Personal Author Entries

Personal authors need to be distinguished from other entries if:

1. Separate indexes or catalogs are to be made for personal authors.

2. The convention of filing personal names before corporate names and titles is to be followed.

3. Special techniques are to be used in on-line searching or other machine matching of names, which will discover not only exact matches but also the near matches or probable matches of personal names. If, for example, the search input consisted of a surname and initials, the file could be searched for this form and also for all cases where the surname and initial letters of the forenames were identical. Also, in a file in which the names were not in an authorized or established form, a somewhat similar technique might be used to determine probable works by the same author by examination of forenames, initials, and perhaps also date of publication.

Although there are some exceptions, most names currently being processed are surname entries consisting of forenames and surnames, the forename preceding the surname in natural order, and the surname being the part that would come first in any alphabetical list. Forenames and surnames have to be separately identified if, from one input, the name is to be generated in natural order (as in an author statement or author by-line) and in inverted order (as in an index or entry in a catalog). In on-line inquiry, it would be desirableto either have the cross references that give the various spellings of a surname appear when the surname was addressed or to automatically search under variant spellings when no exact match was found. The components of this type of name entry -- surname,forename(s), designation (title), dates and relators (ed., etc.)-- will have to be separately identified if filing order conventions are to be followed:

Surname alone
Surname with designation only

Surname with forenames or initials
Surname with forenames, designation
Surname with forenames, with dates

In on-line searching and machine matching, the separate identification of the component parts will allow for particular components to be ignored when desired, e.g., ignoring dates, designations, etc., in name matching. In an integrated system where input initiates with the order record and is then added to or changed as the processing continues, information such as dates can be added to the original input without need to change the entire entry. Also, if it is desired to distinguish titles that precede the forename in natural order from those that do not, the two types will have to be separately identified.

Forename entries will have to be distinguished from surname entries if filing conventions are to be observed. The capability of filing by either the Library of Congress or the ALA filing rules would require separate identification of the following:

1. Saints, popes, sovereigns, princes or noblemen, and pseudonyms.

2. The country of a sovereign.

3. The numerals assigned to popes and sovereigns.

4. The name between the numeral and the designation in a sovereign's name entry.

5. The designations which indicate office, rank, or position.

6. Other designations or appelatives (epithets, bynames, or descriptive words or phrases).

The study of names is very complex and would require much more time to treat it thoroughly than was available in the project. Foreign names and other difficult areas were not covered nor were the filing rules studied in depth.

Corporate Author Entries

Corporate authors must be distinguished from other entries if separate corporate author catalogs or indexes are to be prepared or if corporate authors are to be filed in a dictionary catalog according to the present filing conventions.

The separate encoding of subdivision allows for ignoring the subordinate element whenever this is desirable. Often the subordinate element, for example the name of a particular committee of the National Research Council, may not be remembered or even given in a citation for the work. In such cases, subarrangement by the subordinate element does not aid the search. By separate encoding of the subordinate element, this element may be ignored, and the name of the main body may be co-ordinated with any other element, such as subject or date, in on-line searching. Also, if desired in a book catalog, subarrangement under main body could be by title or date if desired rather than by the subdivision.

Additions to corporate names in entries include:

1. Name of the place, country, city,or state where located (or where the conference was held)

2. Name of the institution where located, e.g.,Newman Club, Brooklyn College, (or where the conference was held).

3. Dates such as year founded, years in existence, or dates held.

4. Any other designation or qualification needed to identify the body.

5. Number of the conference.

In conventional cataloging, additions to corporate names are made usually to distinguish between entries for identical names and, in some cases, when some designation is required to indicate that the name is a corporate name, e.g., Elks (Fraternal Order). Reports cataloging always adds geographic location to the corporate name. The name itself should be distinguished from the additions so that similar things may be compared in machine matching.

Distinguishing among different types of corporate names is required in machine filing and special processing. Place name entries and firm name entries which contain surnames and forenames will have to be identified if present filing conventions are to be followed. Filing conventions also require that the name of the subdivision be distinguished from the name of the main body.

If special machine processing is desired for conference entries, they should be separately identified. Since conferences present such problems, special treatment may be considered appropriate. Distinguishing conference entries from other corporate entries and further distinguishing the parts of a conference entry -- name, number, place held, institution held, and date, could aid in the location of conference materials. Conference entries could be placed in the title catalog as well as the author catalog in a divided catalog situation. Although names of conferences are considered corporate authors by librarians, the layman may consider them titles. Indeed, the name of the conference is considered the title of the conference by many processors of such materials. It may also be desirable to permute the words in the name of the conference to provide access by the key words in its name and to provide access by place held, name of institution where held, and date. Filing conventions also call for filing numbered conferences in a series by number. If this is to be accomplished for all conditions (that the 2d file before the 12th), the number of the conference should be identified. Additional comments regarding conferences are given in Section VII.

Uniform headings (not to be confused with uniform titles) are made up of the name of a government or a religious denomination plus a form subdivision, e.g., laws, statutes, etc. This project has not been able to devote the time to legal publications that it thinks necessary and recommends that special attention should sometime be given to this type of material rather than concluding that what holds for books, serials, etc., holds equally for these materials. This investigator cannot list reasons at this time why uniform headings should be separately tagged. The fact that these headings do not actually represent the particular corporate body that has authored the work may be sufficient reason for separately identifying them.

A number of the systems examined distinguished government bodies, societies and institutions, and religious societies and institutions from other corporate bodies. Such distinctions do allow for selecting or retrieving a particular type of name. Also, such distinctions can narrow a search in coordinate searching. In future systems in which authority files are maintained in machine-readable form, the indication of type of name may be indicated only once, in the authority file, and not for each work processed.

Title Entries

Most abstracting and indexing services do not give title entries. The reason for this may be that journal articles account for most of the materials processed by these services and that approach by title is not considered a very useful approach for journal articles. The chance of remembering the exact title of an article is not strong and certainly less probable than remembering an author's name, affiliation, or the subject of the article. Title entries are not given by the reports abstracting services, probably for the same reason.

Title entries are considered desirable approaches for books and serials. They are usually generated automatically from the title statement although there may be need occasionally for additional title entries which cannot be generated from the statement.

Uniform Title Entries

A uniform (or conventional) title is actually an "established" form of a title, similar in function to an "established" form of an author's name. It is a technique by which the records for the various editions of a work are brought together or linked in a card catalog. It should be noted that there are more efficient techniques for directly linking the machine records for such works.

A work that requires a uniform (or conventional) title may be entered under the uniform title (e.g., an anonymous classic) or it may be entered under an author. In this report, the term conventional title is used when the work is entered under an author and the term uniform title is used when the work is entered under the uniform title. In a mechanized system the two should be distinguished because different printing formats are required for each. Additional comments that pertain only to conventional titles are given with the comments on title statement. Uniform titles should be distinguished from title main entries so that they can be formated as author main entries in traditional card or book catalogs.

In cases of translations, the language(s) is added to the heading for a uniform or conventional title. The notation of language could be generated automatically if the record was tagged a translation and if the language(s) were included and tagged. Separately identifying the language and other designations such as "Play", "Anglo-Saxon poem" allows for machine matching on title alone in on-line searching. Since the designation is not apt to be known at inquiry time, excluding it from the data being matched would seem desirable.

As might be expected, the element uniform (or conventional) title is found only in the traditional cataloging record for books but not in records for other bibliographic forms.

Series Entries

A series statement or entry can be conceived as being made up of author, title, designation of the part numbered,(e.g.,no., vol.,)and the number itself. Every series statement or entry does not contain all of the elements mentioned above.

Some of the existing systems distinguish between series title entries and series author-title entries. This identification is necessary if in a divided catalog, the series title entries are to be filed in the title catalog and the series author-title entries are to be filed in the author catalog.

Further identification of author and title within an author-title entry allows for special formatting of these entries or headings in a card or book catalog. Also, if it is desired to provide an entry in a title catalog under the title part of the author-title series statement, it can be done.

Of the systems examined, only one, the Cambridge Philosophical Library (98), separately identified series number. To sort by series requires that the number be identified so that it can be sorted properly (so that 2 will precede 19). Since the number is the last item in the series statement, this can usually be done automatically. Separate identification of series number is also necessary if arrangements other than number (e.g., author, date, or subject) are desired for the series.

In on-line processing and inquiry using series authority files, it may be desirable to separately identify the individual parts of a series entry. Under such input conditions, it would seem that the number should be separately identified. Also, depending on how the authority files were set up, it might be desirable to separately identify and separately enter the author and title.

When a series is subordinate to another series, the subordinate series will have to be identified if it is to be ignored in filing or if it is to be suppressed in printing the series entry or heading in a card or book catalog.

The above comments pertain mainly to monographs in series cataloged as separates. Series entries for technical reports are discussed in Section VI.

Author-Title Entries

If author-title entries are to file with the other entries or records for the same work, such entries will have to be separately identified, the component parts, author and title, separately labeled, and the type of author, personal name or corporate name, indicated.

Subject Entries

Subject entries have to be distinguished from other entries to allow for:

1. Separate subject catalogs or indexes.
2. Filing in a dictionary catalog.
3. Checking or matching against appropriate files.

Personal and corporate names as subject entries have to be distinguished from general subject headings if:

1. The appropriate authority file is to be matched or checked.
2. Options are allowed in filing these entries, in divided catalogs, e.g., in the subject catalog or in the author/title catalog.

Author-title subject entries require separate identification if filing conventions are to be observed. Separately identifying geographic names(main subject headings,as well as subdivisions) allows for special geographic indexes, catalogs,and searching. Filing conventions also require the identification of place or geographic names as subjects. The authority for the subject terms should be indicated whenever there may be more than one authority for the subject terms entered.. The authority may be indicated once in the entry in the local authority list rather with each subject entry in the catalog.

Classification numbers and subject codes are included with subject entries because they seemed to be more closely related to subject entries than they are to either "statements" or "notes".

Statements

Title Statement

The reasons for separately identifying the title are many:

1. To allow for different styles of type font and punctuation in printing.

2. To allow for various ordering of elements (e.g., title first or author first - title second) depending upon the preference of the producer of the citation and the prospective uses to be made of it.

3. To allow for making title indexes or catalogs (e.g., a title index such as *Books in Print* or a title entry in a catalog) automatically from the recording of the title statement.

4. To allow for filing of title entries after other types of identical entries as required by filing conventions.

5. To allow for subarranging identical (non-title) entries by title as required by filing conventions.

6. To allow for listing the title along with the index entry, (author or subject) in an index such as a publisher's index to a journal, an index to a publisher's catalog, or an index to an abstracting service.

7. To permute the words in the title for a KWIC index.

8. To allow for subject searching by words in the title as a supplement to or substitute for subject searching by applied subject terms or classification codes.

9. To omit it when desired, e.g., some journals do not include titles in bibliographic citations in their publications.

If the title added entry does not include the entire title statement but only the first part of it, the part included has to be separately identified from the part excluded. The reasons for distinguishing the subtitle from the rest of the title are:

1. To ignore, exclude, or position it as desired in the particular product being made. For example, in filing different

editions of the same book, subtitles are ignored. In filing periodical titles, the subtitle is ignored unless the titles are identical. It may be desirable to exclude the subtitle from certain products, e.g., a check-in record or holdings list.

2. In the report literature, the descriptive note (which is equivalent to the subtitle) should be separately identified so that it may be printed in a different type font if desired by the report abstracting service and also so that it may be excluded when desired. Since the descriptive note does not contain words indicating subject content, but rather words indicating the type of report (progress, final) and the period covered, it may be desirable to exclude this when listing the title in the various indexes, when KWICing titles, or in subject searching by machine for particular words in the title.

The language of the title must be known if the initial article is to be automatically ignored in filing the title. If classified material with classified titles is included, the security classification of classified titles has to be known so that they can be excluded from any unclassified listing and also so that the security classification of the title can be indicated in a classified listing.

Many abstracting and indexing services prepare English translations for foreign language titles. Some give both original and translated versions in their citation; some use two different type fonts for the two versions; some give only one version in the index to the abstract citation. Index Medicus, for example, gives the title in the original language in the author index but the English translation in the subject index. Such manipulations require that the original and translated versions of the title be separately tagged.

Whether a translation or transliteration of the title is supplied by the processor or appears on the piece itself may also be desired information about a title data element. Traditional cataloging rules do not give translations for titles, but when the title appears in different languages on the piece itself, the other language versions of the title may be recorded depending upon the conditions present. Added entries (or title approaches) under the titles in the other languages may be desirable when they appear on the piece.

In the future, output devices which can print characters other than Roman will be available. The alphabet of the title input data will then have to be known, if data in other alphabets are to be sorted in their proper sequence.

Conventional Titles - Separately identifying the conventional title allows for the special formatting required in printing catalog cards and also for subarranging under main entry by conventional title rather than title statement in filing.

(See also comments on uniform title entries.)

Recording Considerations - In conventional cataloging of books, the title is usually recorded exactly as it appears on the title page. The main exception to this is the omission of the author's name under certain conditions. Perhaps the reason for this is that on the catalog card, all the information in a record is always displayed, and displayed in a precise format. The main entry always appears in conjunction with the title. It is understandable, therefore, that the practice of omitting the name of the author when it repeats the main entry information has developed. When we consider a mechanized system with the capability of many uses and products from the same input, we might question the desirability of even this slight tampering with the recording of the title statement. In all products, the main entry may not precede the title statement.

The recording of the titles of serials is another instance when tampering with title can lead to limitations in usefulness. The problems occur when the title is entered under corporate body rather than title. (The Anglo American Cataloging Rules specify that a serial is entered under corporate body if the title contains the name or the abbreviation of the name of a corporate body.) When entry is under corporate body, the name of the corporate body is usually omitted from the title statement. The Journal of the American Chemical Society is, therefore, entered under "American Chemical Society," and would be tagged, corporate author. The title statement is "Journal" and would be labeled as such. (If the whole thing, i.e.,corporate body plus title statement were tagged title,catalog cards would not be properly formatted, nor would this entry appear in a divided catalog under author.)

Problems arise whenever there is a need to retrieve the title and manipulate or display it without the main entry. The resulting title alone is not adequate identification for a check-in system nor for a holdings list. Also, whereas libraries enter certain serials under corporate author in their catalog, they may use the title as it appears in the piece for the serial check-in record.

It is interesting to note that the Texas A & M serials system (96) has a data element, "title", in addition to the data element "catalog entry." "Title" is used whenever the title on the arrival card differs from the catalog entry. The Chemical Abstracts system (23) separately tags "title" and "AIA entry."

Many libraries use the title as it appears in the piece for holdings lists and shelve the volumes by this title. This practice is especially popular in scientific libraries. The reasons for it have been explained by Esterquest (37).

Although tagging cannot resolve many of the problems that arise due to different practices in recording data, this is one instance where tagging may help. By using separate codes to identify (1) the corporate author, (2) the modified form of the title, e.g., "Journal", that is to be used when entry is under corporate author, and (3) the title as it appears on the piece, the catalog entry can be generated when desired, author catalogs or approach by author is possible, and it is also possible to retrieve the title as it appears on the piece when this is desired.

The differences encountered in recording a periodical title in a journal article citation are numerous. It may be recorded either in full or abbreviated form. Also, many variations in either full or abbreviated forms may be found. There has been a considerable amount of acceptance among abstracting and indexing journals of the USASI standard for abbreviating words in periodical titles. It should be noted, though, that this standard standardizes the words in the title but does not necessarily produce a standard abbreviation for each title. Whether the full title is thought of as American Chemical Society Journal or Journal of the

American Chemical Society makes a decided difference in the abbreviated form of the title.

Machine matching of citations necessitates requirements for standardizing periodical titles more severe than ever encountered in manual systems. Unless such titles are processed against authority files with numerous cross references, they must be recorded in exactly the same fashion if they are to match. Three of the systems examined in this project match journal citations. Two of them, the UCLA Brain Information Service (19) and the M.I.T. Project TIP (Interview, September 27, 1966) manually input a numerical code for the periodical title. The third, Science Citation Index, (Interview, October 14, 1966) matches on a specified number of characters from the first author's surname, and a specified number of characters from each word in the abbreviated form of the periodical title.

There has been talk of making CODEN codes the standard abbreviations for periodical titles. There has been considerable objection to this idea, the main reason being that CODEN codes do not remain mnemonic when applied to a large population of titles and that a table look-up process is required in establishing or using them. They do, however, provide a unique identification for the serial which might prove very useful in matching citations or in developing central files of serials data.

Author Statement

In the conventional cataloging of books, the author statement is included in the body of the entry immediately following the title statement. It is not included if it duplicates or nearly duplicates the information in the main entry or in the imprint. Again, the reason for this is probably that all the information in the record is displayed on the catalog card and repetition of the same data is avoided.

Simonton (93) in his discussion of descriptive cataloging in relation to computerized catalogs has questioned whether the author statement is as necessary as has been assumed and whether it might be more effectively presented in a note. Actually, all bibliographic citations have author statements. In such statements, surnames may precede forenames or vice versa. The form of the name may or may not be the same as what appears in the work. The statement may precede or follow the title statement. (In conventional cataloging of serials, the author statement may also be presented in a note.) In the author statement, the words that express the relation of the names to the work may be transcribed exactly as they appear on the title page, they may be eliminated,or they may be reduced to the common form "by."

In conventional cataloging, the author statement serves the purpose of retaining a certain amount of "bibliographic integrity" in the catalog record by presenting not only the names as they appear in the work,but also the exact words used on the title page to express the relationship of the names to the work. This more or less compensates for the somewhat (or sometimes) altered form of the name in the main entry which is so prominently displayed in the catalog citation.

Abstracting services are in a somewhat different position. The form of the name in both the index entry and abstract citation is usually the form that appears in the work, but the words that express the relationship of the name to the work need not be transcribed exactly as they appear on the title page. It is not surprising, therefore, to find the same input data being used to generate both the author entry in the index and author statement in the citation. Also, the majority of the works processed by abstracting and indexing services are journal articles and technical reports. With such works, statements regarding illustrators are not usually found and statements regarding translators are usually given in notes. This being the case, author statements usually pertain only to authors, whereas in books the author statements can refer to names associated with the work other than authors.

Separately identifying the author statement allows for including it or excluding it, as desired, in the particular product being made. Eliminating it in such products as finding lists or index type catalogs may be desirable because savings in space mean savings in printing costs.

Most of the systems examined did not separately identify the author statement. Marking the end of the title added entry is common practice with much variety in opinion as to what else should be labeled in the body of the entry. The Yale mechanized system (97) does not separately identify the author statement, but it does indicate if there is an author statement in the record. When present, the author main entry does not have to be included in their title catalog.

Affiliation Statement

Affiliation statement is not given in the conventional cataloging records for books or, understandably, for serials. Abstracting services, however, do consider it valuable descriptive information and include it not only in records for journal articles and technical reports but may also include it in records for books.

The affiliation as it appears in the journal article, book, or report contains the name of the organization and usually its location. The name of the organization may include both main body and one or more subdivisions. The location may be made up of one or a combination of the following elements: city, state or province, country. The name of the subdivisions may precede or follow the name of the main body. The number of subdivisions given for a particular unit of an organization may vary. For example, Cruft Laboratory may be given as Cruft Laboratory, Department of Physics, Harvard University or Cruft Laboratory, Harvard University.

If the affiliation statement is used only to indicate where the author works, as it is in an abstract journal, the differences in the naming and ordering of the main body and subdivisions, the number of subdivisions and the differences in abbreviations are of no consequence because human intelligence interprets the data. The assigning of one code to the entire affiliation statement will satisfy the printing style requirements for font and will allow for positioning the statement as desired. If an index by affiliation is to be made, the main body will have to be identified to allow sorting on this element first. (*Science Citation Index* achieves the same effect by having their keypunchers punch main body first, then subdivisions regardless of how the name appears in the affiliation statement.)

If other options in filing or printing of a printed index are desired such as ignoring location or subdivisions, the subdivisions and the location will have to be identified. If a geographic index is to be made, the component parts, city, state or province, and country, will have to be identified.

The identifying of the component parts of the affiliation statement -- main body, subdivisions, city, state or province, country -- also allows for more flexibility in machine searching techniques. If affiliation is not broken down, it is only by a brute force search through every affiliation statement that a particular organization can be found. Brute force searching through the entire affiliation statement could also be used for searching by geographic location. However, if one were searching for Columbia, Missouri, using this technique, Columbia University would also be retrieved. Also, the country may not be given in the affiliation statement. The UCLA Brain Information (19) encodes separately the author's country of residence.

If files were small and plenty of computer time available, brute force searching would be acceptable. MIT's project TIP uses this technique for searching for name of organization and geographic location. Under other conditions -- large files, scarcity of computer time, frequent searching by affiliation-- such a technique would not be satisfactory. The most efficient use of computer time would require the separate identification of main body, subdivisions, city, state or province, and country.

The problems that may be encountered in trying to manipulate, sort, index, and s [illegible] controlled (unestablished) names of corporate bodies and names of places have been expanded here at length. These same problems are encountered in trying to search or manipulate other uncontrolled names such as the name of the sponsor as it appears in the statement of sponsorship, the name of the publisher as it appears in the imprint statement, and the place published as it appears in the imprint statement.

Edition Statement

Separately identifying the edition statement allows for its inclusion or exclusion as desired. For example, in an acquisitions list where the entire catalog record is not considered necessary, the edition statement may be one of the elements chosen for inclusion.

Some edition statements contain names and other facts associated with the particular edition in addition to the number or words such as revised, enlarged, etc. which describe the edition. The Library of Congress system (106) separately identifies such statements. The University of Toronto ONULP system (14) also has both a full and an abbreviated edition statement element.

Holdings Statement

In cataloging practice, the designation of volumes and dates in the body of the entry can refer to the initial (and terminal) volumes published or the initial (and terminal) volumes held by the library. If the library chooses to enter holdings information in the body of the entry, then the information concerning volumes and dates published is presented in the notes. If the library records volumes published in the catalog entry, holding information is recorded in notes.

In a mechanized system it is necessary to distinguish volumes published from volumes held so that each may be retrieved when desired, so that holdings information may be updated continually and also to allow for other machine processing such as preparation of want lists. Automatic preparation of want lists requires that both "volumes published" and "volumes held" data be recorded in a very detailed and precise manner. For such processing as automatic updating of holdings and automatic preparation of want lists, the parts of the holdings statement -- volume numbering and dates -- should be separately identified. According to L. C. filing rules, serials with identical titles and places of publication are subarranged by date. To do so requires the separate identification of dates. Additional comments on numbering, frequency, and dates of serial issues are given in Section IV with the comments on serials.

Imprint Statement

In the traditional cataloging record for books, the imprint statement contains place published, publisher, and imprint date. In conventional cataloging record for serials, the imprint statement usually contains only place published and publisher with the date given in the holdings statement. Records for journal articles usually contain only date of issue. The place of publication may be given if there is more than one journal with the same name. The publisher is not given in records for journal articles. Technical report cataloging uses neither the term imprint statement nor publisher. The corporate author or the corporate source, as it is sometimes called, may be considered to be acting in the role of publisher. This may be why geographic location is always given in the corporate name heading. In report cataloging, the date of publication is given as a separate element.

Place of Publication

Separate identification of place of publication is required to comply with filing conventions (for serials) and also to distinguish similar serial titles in a file. Place of publication or, perhaps more appropriately, country of publication may be a very useful search or selection parameter either in subject searching or in statistics gathering. Since place of publication in the imprint statement does not always include country, the imprint statement cannot be depended upon for searching by country. Many of the systems examined separately identified place of publication in the imprint statement. A number of the systems include a code for country of publication. Acquisitions work may require the full address of the publisher including street address, city, state or province and country.

Publisher

A number of the systems examined also separately identified the publisher in the imprint statement. The Library of Congress system (106) and the original Florida Atlantic University (82) system include a code for publisher.

Identification of the publisher may have certain usefulness in acquisitions work. If, for example, a basic list such as the California list were converted to machine-readable form, with name of publisher separately identified, new libraries need only select by an identifying number the items desired,and lists of the selected items could be generated, sorted by publisher. It is recognized that changes in name of publisher and inconsistencies in recording it will present certain difficulties. In serial processing, the publisher is usually separately identified in mechanized check-in and acquisition systems.

Approach by publisher is not found in manual systems. In cases when the publisher is not a commercial organization, but rather a society or institution, the publisher may be one of the names remembered for the work and, therefore, a desirable access point.

Although it would seem that the concept of publisher is well understood, there are instances where there is not universal agreement as to who is the publisher and what is the city of publication. Serials which are issued or sponsored by societies are an example. Is the publisher the society (sponsoring body) or the commercial printer? Should the place of publication refer to the headquarters of the society or the city of the printer? The placement of subscriptions, renewals and claims by either a library or an agent requires that the source or point of contact for each of these transactions be included and identified in the record. Conventional cataloging on the other hand, has a different basis for the determination of publisher. In an integrated serial acquisition-cataloging system, provision should be made to accommodate both the acquisition and cataloging requirements as to the publishing-distributing function.

Date

The date needs to be separately identified if material is to be retrieved by date or if material is to be filed or subarranged by date.

Whereas only the year is involved in the imprint date for a book, month and day can be used to designate the date of serial issues, journal articles, and technical reports. In an automated serial check-in system, separate identification of the components day, month, season, and year is required if the designation of month, day, etc. is to appear in lists of recent arrivals and if the holdings are to be automatically updated.

Some bibliographic guides and some abstracting and indexing services give day, month, and year of issue whereas others give only the year. The capability of including or excluding the parts of the date requires the separate identification of the parts.

Collation Statement

The physical features of materials have been traditionally included in bibliographic records in varying degrees of completeness and specificity depending upon the type of work being treated and the importance of the physical description to the type of work.

Separate identification of the collation statement allows for excluding or including it as desired and for formatting it as desired in printing catalog cards and other products. Separate identification of the bibliographic and physical units contained in the collation statement is required if statistics are to be gathered automatically from the information in the collation statement. In the proposed American standard for compiling book publishing statistics, the number of pages is the distinguishing characteristic that determines if an item is a book or a pamphlet. The number of pages would have to be separately identified if publishing statistics are to be generated automatically.

Since some libraries base their statistics on bibliographic volumes and others base theirs on physical volumes, the number of both bibliographic and physical volumes should be separately identified. Whatever the designation for the physical unit may be -- reels of microfilm, sheets of microfiche, etc. -- it will have to be separately identified if the statistics are to be derived from the information in the collation statement. Another view of this is that the same data element may be used to generate either statistics or collation statement.

Thickness might be desired if book labels are to be made by machine. It might also be used to indicate growth of the collection and shelving requirements. If books were shelved by size and shelf location numbers determined automatically, or if "oversized" book were determined automatically, the separate identification of height would be required.

The separate tagging of the physical features of materials which are dependent upon some piece of equipment for their use may be useful in selecting or retrieving items from a file. Since equipment is often designed to handle certain widths of film, certain speeds, and certain character densities, these characteristics are not only important descriptive information, but also may be useful search parameters. Likewise when dealing with non-book material -- portraits,maps, etc. -- the physical characteristics of size, scale, etc. are important characteristics of the material and may be useful in searching.

A number of the systems examined separately identify the number of pages and the height. The University of Toronto system (14) also tags thickness. A number of systems also encode separately the illustration statement. In addition, the Library of Congress system (106) indicates the presence of maps. Florida Atlantic University's original system (82) indicates the presence of more than a dozen different types of illustrative matter. The Yale system (97) indicates the presence of the ten different types of illustrative material automatically by computer scanning of the collation statement.

Series Statement

Separately identifying the series statement allows for the special formatting requirements in printing. Also, if the series entry is to be generated from the series statement, the statement has to be identified as such. In such cases, the comments referring to identifying the various parts of the series entry also apply to the series statement.

Notes

Notes can contain any statement of information about a work that is not included in the formalized part of the cataloging record.

In conventional cataloging, any information about the author, title, edition, or imprint that does not fit easily into the formalized body of the entry can be presented in a note. Notes are also used to justify entries; to characterize a work; to give the bibliographic history of a work or to describe the conditions of the copy being cataloged. Notes for serials are many and varied, because data describing serials are so subject to change, and because of the complicated bibliographic history of many serials. Notes in report cataloging are somewhat similar to conventional cataloging, although we do not find notes used to justify entries.

The practice of abstracting and indexing services in giving notes for journal article records varies. Since the emphasis here is on subject analysis rather than bibliographic analysis, notes that distinguish different editions of a work, notes that justify entries or notes that give the bibliographic history of a work are generally not found. Notes that characterize the work as to language, scope, or subject content may be given. The report abstracting services include notes such as "presented at conference. . . " for journal articles.

Some of the information which has been presented in notes in the past has been taken out of notes in a number of mechanized systems. In a serial check-in system, data regarding frequency and numbering must be input in a precise and numerical fashion if arrivals of serials are to be predicted. The language of the text, the language of summaries, the physical form, and the inclusion of a bibliography have also been taken out of notes, separately identified, and in many cases given in coded rather than natural language form.

Reasons for separately identifying notes are:

1. To allow for special formatting such as positioning a title romanized note after the tracings, or a frequency note after the collation.

2. To allow for generating both entry and note from the same input data. This is currently being done in many systems where the series entry is generated from the series statement (formerly called series note). Problems occur in conventional cataloging in using this technique because the descriptive cataloging data is in the words of the author or publisher and the entry is normalized to the standardized or established form of the catalog.

3. To allow for including or excluding a particular kind of note, as may be desired for a particular product, e.g., including history notes but excluding other notes in a serial holdings list.

4. To allow for retrieving or excluding particular records in a search, e.g., including only English language materials.

5. To allow for special machine processing such as predicting the arrival of serial issues from information regarding their frequency and numbering.

Except for the separate identification of language and similar facts, existing systems do not distinguish among the various types of notes to any extent. A few separately identify contents and bibliographic notes. If contents notes were separately encoded, and the components, author and title, identified, access by author and title of the individual parts would be possible. It is true that the form of the name might not be consistent with that established in the catalog but in certain situations it might be judged better than no access at all. If desired, such entries could be excluded from the card catalog but available for on-line searching or used in separate indexes or finding lists.

Lang (65) has suggested that provision should be made to insert notes along with any data element. These notes would be separately identified from the data element itself. The Augmented Catalog at MIT's Project INTREX (9) has such a provision. When entering any data element, a note can be given. This is separately identified as a note, but using their technique, the note is linked to the data element to which it applies.

Another interesting feature of the Augmented Catalog is the use of a special field, "variants," to enter information about documents that vary in language or media, (e.g., microfilm) from the document being cataloged. For each variant document, the language, media, library location, call number, original edition indicator and title (if different from title being cataloged) are input and separately identified. Information such as this, on variant editions has conventionally been placed in notes. In cases where the variant document is already in the machine store, a "transfer code" is used. This code contains the record number of the variant document. When it is given, it is not necessary to input the variant title and library location. This technique decreases transcription errors, shortens input time, and may save storage space. It also provides "machine" linkage of related records within the machine store. Transfer codes are also used in analytics where they are given instead of the identification of the major work.

The government report abstracting services distinguish between distribution/availability statements and supplementary notes. The reasons for doing so are (1) to allow for the distribution statements to be linked to, and used in conjunction with, distribution codes and (2) to format new paragraphs. The availability and price note is distinguished from distribution/availability statements. The CFSTI system (Interview, November 18, 1966) separately identifies notes containing the published citations for reports. This allows for "Published in" to be automatically inserted in the note and for the note to be printed in italics. A minor difference between report and conventional cataloging is that the name of the translator is not given in the body of the entry but in the note describing the original language edition. The NASA system (12) also has a separate code for historical notes.

It is also interesting to note that although NASA does not separately tag its various notes other than historical notes, it positions certain notes such as theses notes and analytics, before the imprint-collation and all others after imprint-collation. (NASA has lumped imprint, collation, and notes into one field.)

Considering the wide variety of data that can be contained in notes, the usefulness of such a category in on-line processing and on-line inquiry is open to question. Large amounts of data will be available for interrogation. Only experience in use of such systems will indicate the groupings of data that may be appropriate.

Frequency and numbering notes are discussed in Section IV, Serials.

III. COMMENTS ON BOOKS AND CONVENTIONAL CATALOGING

The master list of elements, as well as the comments on why tagging is required have been oriented toward the book and toward the practices of conventional cataloging. This being the case, there is not the same need for extra comments pertaining to this form and to this type of record as there is with the other bibliographic forms. Some comment does seem to be required, however, on the conventional catalog record when viewed as a bibliographic citation.

The catalog identifies and describes the work, provides multiple approaches or access points to it, and relates it to others in the collection. In contrast, a bibliographic citation only identifies or describes the work. An abstract journal, with separate indexes, both identifies the work and provides multiple access points to it but separates these two functions. In one section the statements that describe the work are displayed; in another section, the index entries to the work.

In conventional cataloging, problems arise in trying to use the same data for both entry and statement because the catalog uses an established form of the name in the entry in order to bring together in the catalog all the works of an author and all the editions of a work. This has sometimes resulted in a certain loss of bibliographic integrity in the entry, in that the form of the name in the entry differs from the form of the name in the work itself. In contrast, or perhaps to compensate, the data in the author and title statements strictly adhere to the work itself, not only in the form of the name, but also in the wording -- exact transcription of the title page.

These multiple goals, coupled with the catalog card technique for accomplishing them, have resulted in a rather strange style for citing a work under certain conditions of authorship. For the simplest case of single authorship, where the form of the name is the same in the entry heading as in the piece, the differences are slight. The entry heading includes, in addition to the name, dates and other identifiers if they are necessary. If the form of the author's name is not the same in the entry heading as it is in the work, an author statement will be included in the catalog citation. This practice of including two forms of the author's name in a citation is not common to all bibliography. Another difference occurs in the case of multiple authorship. Cataloging practice lists first the one deemed primarily responsible for the work, then the title, and then the author statement wherein the name in the main entry is repeated along with the other authors. In other bibliographic citations, all the authors are listed one after the other before the title and there is not any repetition of the first author's name.

One could envision the catalog citation as being a citation in which the title appears first, with all entries added or superimposed on this citation. This does not work for the simplest of cases -- when the form of the author's name is the same in the entry heading as it is in the work. In this case, the author statement is omitted.

It is interesting to note that in the Stanford University Libraries' book catalog, (57) the concept of main and added entries has been abandoned and the main entry has been taken out of the unit citation. The citation begins with the title and is followed by the author statement. All author entries whether they be main or added, all subject entries, and all added title entries are positioned above the title paragraph.

The above discussion points out, that the style of catalog card is not common to all bibliography, and also, that it would be rather difficult to obtain automatically from cataloging input, a bibliographic citation that would be in a form that is a generally accepted bibliographic style under all conditions of authorship.

IV. COMMENTS ON SERIALS

A serial, according to the ALA Glossary of Library Terms, "is a publication issued in successive parts, usually at regular intervals, and as a rule, intended to be continued indefinitely." The additional elements found in records for serials are accounted for in this definition. In common with all multivolume works, whether serial (continuing) or non-serial in nature, they are made up of individual parts. Serial records, therefore, contain the elements necessary to identify these parts. The identification of any one part may include any of the following elements:

Series (Part or Section) number (s)
Volume number (s)
Issue number (s)
Part number (s)
Supplement number (s)
Month (s)
Season
Day
Year (s)

The seperate identification or tagging of each one of these elements is required: (1) in a serial check-in system to predict and identify the next issue to arrive, (2) in automatic updating of serial holdings data, (3) in automatic generation of want lists. These elements are also found in records for journal articles. The reasons why separate identification may be required in journal article records are given in Section V.

The fact that serials are usually issued at regular intervals, accounts for another rather large group of elements that may be found in serial records. Frequency information, both present and past, is given in the catalog record in a note. If it can be stated in a simple and brief statement, it follows the collation statement. If it cannot be stated briefly, and if there have been changes in frequency, it is given in the drop note position.

The informal recording of frequency information found in records in manual systems is not adequate in mechanized check-in systems. In such systems, frequency is generally given in coded form. There is much variation in the frequency codes used in existing systems.

In addition to frequency codes, most serial check-in systems include other information concerning when issues are published. Time frames indicating the months of publication are used in a number of systems. Also the weeks of the months, the weeks of the year, the date of the month, or day of the week may be indicated in conjunction with, or instead of, the months of the year published. These are all attempts to precisely state when the issues are published. The variety is caused by the different requirements for the different frequency types (e.g., monthlies, weeklies, etc.), and the different systems approaches that have been taken in mechanizing the serial check-in operation. Another point that should be born in mind, is that information regarding when issues are published can be entered into the system via "local" data elements. For example, the date of the last issue received by a library is "local" data which is used in some systems to launch the mechanized check-in system. This data, in conjunction with frequency information, can be used to generate information regarding the date of the next issue.

Information regarding the numbering of a serial is required in automatic check-in and holdings updating. Again, as with frequency, the information must be recorded in a precise form. The different numbering patterns used by publishers and the various systems approaches taken are the reasons why there are so many data elements pertaining to numbering characteristics. (The data elements relating to frequency and numbering are found in the master lists under notes.)

In addition to catalog, holdings, check-in and circulation records, the project considered the information that might be collected and distributed by a national clearinghouse for serials data such as described by Creager (33). If such a center were established, it might contain cataloging data; frequency, numbering, and indexing information required for check-in systems; location information;and information about the contents of serials. A number of elements in the notes section of the master list relate to information that might be desirable in such a center.

Cataloging of Serials

The cataloging of serials is more formalized than that of monographs and adheres less to title page transcription. A number of differences are found in the arrangement or sequencing of the elements. Subtitles are usually given in notes; author statements are always given in notes. Dates are not given in the imprint statement but in the holdings statement, an element which is not found in monograph cataloging. The complicated bibliographical histories that serials may experience result in many and varied notes.

The differences found in recording serial titles have already been mentioned in the comments on title statement. Since periodicals are usually identified by title only, the title is an extremely important element in any serial record. Other differences in recording or entering the title may exist in changes of the title. Under the old cataloging rules, a change of title does not constitute a new bibliographical entity (or entry) unless the volume numbering also changes. Under the new rules, a serial is entered under each successive title regardless of volume numbering. It has been stated (42) that the Library of Congress will continue to observe the old rules for serial title changes.

If separate records were set up according to the new rules under successive titles, with beginning volume numbering and date separately tagged in each record, and with the successive records for each title change linked in the machine store, it would be possible to have the output according to either the new or the old rules. Entry could be made under the latest title with notes or cross references from earlier titles. When title change involved a change in volume numbering, separate entries could be generated. If such a technique were employed, attention would have to be paid to the other elements in the successive records since the other elements might not be the same for the entire run of the serial.

V. COMMENTS ON JOURNAL ARTICLES

Records for journal articles do not contain elements which are not found in records for books and serials. As do records for all works they contain authors and titles. Since they are a part of a serial, they contain: (1) the elements necessary to identify the serial, i.e.,title,(or author-title) and sometimes place published; (2) the elements necessary to identify the part, i.e.,series, volume number, issue number, part or supplement numbers, month, day, and year; (3) the pagination.

Abstract and indexing services, as well as bibliographic guides, vary in the elements they include to identify the part of the serial and also in the arrangement or sequencing of these elements in their citations. Separate identification of each element would be required if output according to any individual style was to be generated from one input. Also,as the output of more and more indexing services becomes available in machine readable form, a recipient library or information center may wish to use the input from various sources but may want to eliminate the duplication of citations when they appear in more than one abstracting services tapes. This will require separate identification of the elements such as volume number, page, etc.,if the matching is to be based on these elements. Also, if citation indexes are to be made from the same input as was used to automatically typeset the publication, the various parts of the citation, volume number, pages, etc., would have to be separately identified.

Cataloging of Journal Articles

Journal articles are not usually cataloged in the traditional library. The term "journal article" cannot be found in the index to the Anglo-American Cataloging Rules. In Chapter 6, which treats the descriptive cataloging of separately published monographs, an example of a journal article can be found under analytical entries for parts without special title pages. The elements included are:

- Author entry
- Title (of article)
- "In" note
  - Corporate author of serial
  - Title of serial
  - Place published
  - Height
  - Volume number
  - Year
  - Pagination

The entry for the serial in the example given was one that would be entered under corporate author. Presumably, serials which are entered under title would not contain an author element in the "In" note. With the exception of the height, the elements are those usually given in abstracting and indexing journals and in bibliographic guides. Issue numbers and months, not found in this example,may be found in abstracting journals.

VI. COMMENTS ON TECHNICAL REPORTS

Although technical reports are being considered as a separate bibliographic form, it should be recognized that they overlap other forms. For example:

1. Government sponsored research reports may be issued first as reports and later appear as journal articles.
2. Government sponsored research reports may be published first as journal articles and later become available in report form. This can happen not only with articles published originally in a foreign language, which later appear in translation as reports, but also can occur with articles published in English.
3. Occasionally items appear in government sponsored research report series which in size and content resemble books more than research reports. Some of these are later published by book publishers.
4. Some items in government sponsored research report series are complete proceedings of conferences or symposia.
5. Some items in government sponsored research report series are individual papers presented at conferences.
6. Conventional library cataloging rules do not provide special rules for reports. If each item in the report series is analyzed or cataloged separately, it is considered a monograph. If the item is not cataloged separately, it is considered a serial.

The above considerations have certain implications in tagging the work as being a book, journal article, report, serial, or conference proceeding. How is type to be determined: by the content of the work itself, by the type of issuing agency, or by the treatment it is given in a library?

Cataloging of Technical Reports

Conventional cataloging has no special rules for cataloging technical reports but would treat them as monographs if they were cataloged separately. In October 1966, the Committee on Scientific and Technical Information issued revision no. 1 of the Standard for Descriptive Cataloging of Government Scientific and Technical Reports. In conventional cataloging, the elements listed in the COSATI standard might be equated as follows:

COSATI Element	Equivalent in conventional cataloging
*Accession number	Call (location) number or series number
*Corporate author	Main entry, added entry, or publisher and place published
*Title	Title statement or title added entry
Descriptive note	Subtitle
*Personal author	Main entry, added entry, or author statement
Date	Date in the imprint statement

Pagination	Number of pages in the collation statement
*Contract number	Note
*Report Number	Call (location) number or series number
Availability	Notes
Supplementary Note	Notes
Security classification	Notes

(*Also index entries in the COSATI scheme)

Although there is not a one-to-one conversion between the two schemes, most of the COSATI elements could be converted into the conventional groupings. This should not suggest, however, that the two cataloging systems are compatible to the extent that a conventional library could take the output of a report documentation center, automatically convert the elements into the conventional equivalents, and by so doing have input ready to be inserted into the catalog. The reason why such input cannot be integrated into the catalog is that the entries in the documentation center's input -- personal author, corporate author, series, and subject -- may not be in the same form as in the traditional catalog.

Before going on to discuss the differences between conventional and report cataloging, it might be well to point out that a conventional library cannot take the input of another conventional library, e.g. ,the MARC input record,and automatically include it in its own catalog. Each entry must be checked against the recipient library's catalog. If the form of the name in the input record does not agree with the form established in the recipient library's catalog, the input record must be changed. The amount of searching is the same -- every entry must be searched -- regardless of whether the data are coming from a conventional library or a documentation center. The difference in handling input from a report documentation center lies in the number of entries that would require change. It might also be well to mention that the only alternatives to this manual searching and changing of cataloging entries are (1) to have the recipient library's authority files in machine readable form and to search and change by machine or (2) to accept different forms of the name in the recipient library's catalog.

There are a number of differences between conventional cataloging and that practiced by the report documentation centers. The most outstanding differences are in report number series and corporate authors. These are discussed at length in sections devoted to these two topics. Other variations are mentioned here. First, the concept of main entry is not to be found in the new COSATI descriptive cataloging standard. Second, there is no exact equivalent of imprint statement nor is there any designation of publisher. The ALA Glossary of Library Terms defines publisher as being the "person, firm, or corporate body undertaking the responsibility for the issue of a book or other printed matter to the public." Since reports are not always issued to the public, it is questionable whether they can be considered published. Also, considering the various other bodies involved in the issue and distribution of reports, the equating of corporate author to publisher might be questioned. If the corporate author is considered the publisher, the corporate author statement plus the date can then be thought of as replacing the imprint statement. Third, personal names are not established in report cataloging. Fourth, the contract number index entry has no equivalent in conventional cataloging.

Report Numbers

The most distinguishing feature of technical reports, as compared with other bibliographic forms, is the abundance of numbers associated with the document -- accession numbers of the document processing centers, originating agency numbers, monitoring agency numbers, and contract (or grant) numbers. It is the treatment of these numbers that constitutes the main difference between conventional cataloging and that practiced by the report documentation centers. In conventional cataloging, these numbers, with the exception of contract numbers and possibly also accession numbers, would be considered series numbers and would be entered as series entries with the title or the author-title of the series preceding the number. In report cataloging, the author and title of the series are reduced to acronyms or other symbols, or ignored. Although direct approach by identifying number or code is not presently found in the conventional catalog, it is doubtful that this condition will continue in the future. The superiority of numbers or codes to verbal description in machine processing has been recognized by all. Numerous pleas have been made to have a unique identifying number printed in the book when it is published. Machine processing has given added importance to Library of Congress card numbers and CODEN codes. It is, therefore, not unreasonable to expect that in the future, approach directly by number or code may be provided for the items in the conventional catalog.

Integrating report series entries into a conventional catalog would require the insertion of the author and title of the series into the entry. This might be accomplished by having in machine readable form either special series authority files or corporate author authority files including series information which would allow conversion from the report series number to the conventional entry. There would be problems involved in doing this because all report numbers do not indicate the corporate author.

Inconsistencies exist in recording report numbers in the document and in the document record. When the report numbering is controlled in the production stage, as it is with most of the research sponsored by the Atomic Energy Commission, the number usually will be recorded on the document in a standard, specified format which uses the approved acronyms for the originating agency and series title. When the issuing agency is not under such firm control, the report numbers may appear with or without acronyms and with variations in the recording of series titles.

In addition to the variations found in the document, there are the variations in treatment by the processing centers. Defense Documentation Center always assigns an acronym for the issuing agency if one does not appear on the document. The other centers do not. According to the COSATI Standard for Descriptive Cataloging of Government Scientific and Technical Reports, series titles such as "Technical Publication", "Circular" and "Technical Memo" may either be ignored or abbreviated to "TP", "Circ" and "TM". Considering the different practices of originating agencies, documentation centers, and also authors citing reports, it can be seen that there will be difficulties in any machine matching of report numbers.

The three government documentation centers vary somewhat in their tagging of report numbers. Defense Documentation Center separately tags originating agency number, monitoring agency number, its accession number, the contract number, project number, task number, and document serial number. The National Aeronautics and Space Administration separately tags its accession number, contract number, and groups all other numbers in a report number category. The Atomic Energy Commission separately tags "report number" (the originating agency number, usually), contract numbers and groups other numbers into a category called "secondary report numbers".

Separate tagging of contract (or grant) numbers allows for producing separate contract number indexes. To the uninitiated, recognizing and distinguishing contract numbers from report numbers may not always be easy or possible. Searching strategies, both manual and machine, should take this into consideration.

Separate identification of project numbers and task numbers permits the exclusion or inclusion of these numbers from indexes as desired.

Corporate Authors

The COSATI rules for establishing corporate names differ from conventional rules. The main differences are:

1. The geographic location of the body is always included.
2. Only two organizational elements may be included.
3. The order of the elements should be -- largest element, place name, smallest element.
4. U.S. is omitted before government headings.
5. The report series number can influence or govern the establishing of the name.

COSATI has also begun to develop a standard corporate author authority file to be used by the government documentation centers. Initial plans were to include and tag various data about each name such as cross references between old and new names; cross references from non-approved forms of the name; separate identification of the subdivisions of the name; numeric code identifier; street address; geographic location; and series information. This list, when it becomes available, will be a valuable tool for libraries that service technical reports. If the conventional form of the name were also included in the file, the file might serve as a conversion tool.

In addition to the corporate authors, (originating agencies) associated with reports there are the names of the monitoring or sponsoring agencies. Defense Documentation Center separately tags the acronym for military sponsors. The Atomic Energy Commission and the National Aeronautics and Space Administration do not tag the name of the sponsoring body. In most cases, perhaps in all cases, the monitoring agency's name can be derived from the contract or grant number. Sponsoring agencies not indicated by contract or other numbers are named in supplementary notes but not indexed.

COSATI Bibliographic Data Elements

The subpanel on Standardization of Descriptive Cataloging of the COSATI panel on Operational Techniques and Systems has been studying the data elements that should be included and identified in the machine tapes for technical reports of the government agencies. In the report of their study (27) they have noted the data elements in three ways: included, identified and retrieved. These terms are explained as follows:

> The phrase "included but not identified" has been used for information that should be included in the tape, but may be in a field with several pieces of information, and is therefore not identifiable nor retrievable as a separate entity; such information would not be incorporated in a retrieval file. The phrase "identified field" has been used to indicate that the information appears in an assigned field, but that there is no probable need for direct retrieval of the information, and that it would not be incorporated in a retrieval file. The phrase "retrieval point" has been used to indicate information that not only appears in an assigned field, but is also stored so that it may be used in the preparation of indexes, etc.(27)

Bibliographic Data Elements for Machine Tapes for Technical Reports(27)

Data Element	Recommendation		
	Included	Identified	Retrieval
Abstract		X	
Accession number: See Agency accession number			
Affiliation of personal author		X	
Agency accession number See also Report numbers			X
Author(s) (Personal)			X
Availability and price		X	
Availability limitations: See Distribution/Availability limitations			
Contract/Grant: See Financial support number			
Corporate author (words) (Originating agency, Performing organization)		X (if codes are also used)	X (if codes are not used)
Corporate author code (Source code numbers)			X
Date - Report		X	
Descriptive note: type of report, e.g., progress and inclusive dates	X		
Descriptors: See Subject terms			
Distribution/Availability limitations (Release limitations)		X	

Data Element	Recommendation		
	Included	Identified	Retrieval
Document classification (security): See Security classification - Document			
Field/Group (codes): See Subject categories (COSATI) (codes)			
Financial support number (contract, grant, order, etc.)			X
Funding agency: See Sponsoring agency			
Identifiers: See Subject terms			
Index annotation (short title, annotated title, etc.)		X	
Journal citation	X		
Keywords: See Subject terms			
Language of document			X
Limitations: See Distribution/Availability limitations			
Military sponsor: See Sponsoring agency			
Military sponsor series: See Report numbers			
Monitoring agency: See Sponsoring agency			
OA series: See Report numbers			
Originating agency: See Corporate author (words)			
Pagination	X		
Patent number: See Report numbers			

Data Element		Recommendation	
	Included	Identified	Retrieval
Performing organization: See Corporate Author (words)			
Personal author affiliate: See Affiliation of personal author			
Personal authors: See Author(s) (Personal)			
Price: See Availability and price			
Project name: See Subject terms			
Regrading: See Security group number			
Release limitations: See Distribution/ Availability limitations			
Report number:(Military sponsor series, OA series Patent numbers, Secondary position number) See also Agency accession number			X
Scientific or technical areas: See Subject categories (COSATI)			
Secondary position number: See Report numbers			
Security classification - Document		X	
Security classification - Title		X	
Security group number (declassification group, regrading group)			X
Series title	X		
Short title: See Index annotation			
Source code numbers: See Corporate author code			

Data Element	Recommendation		
	Included	Identified	Retrieval
Source of abstract	X		
Sponsoring agency (Funding agency, Military sponsor, Monitoring agency)			X
Subject categories (COSATI) (codes) (Field/Group codes, Scientific or technical areas)			X
Subject classification groups other than COSATI			X
Subject terms (Descriptors, Identifiers, Keywords, Project names)			X
Supplementary notes	X		
Title		X	
Title - Classification: See Security classification - Title			

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VII. COMMENTS ON CONFERENCES

It was originally proposed that conference proceedings be studied as one of the bibliographic forms covered by this project. Actually, conference proceedings are not a separate bibliographic form but are published and processed as books, serials, journal articles, or reports. They do, however, represent a very popular means of communication and a very large percentage of the items that are difficult to find and process in a library. For these reasons, they have been given special consideration in this project. The following comments refer not only to "conferences," but also to "congresses," symposia," "meetings,""institutes," "colloquia," etc. The distinguishing feature is that they contain the papers, or revisions of the papers, presented at meetings.

The elements that describe and identify conference proceedings are the elements that identify and describe the publication plus the elements that describe the conference. If the form of publication is a book, the elements author, title, place, publisher, date are involved; if a report or serial, the elements that identify the report or serial.

The elements that identify or describe a conference are:

Name of the conference

Number of the conference

Place(s) where conference was held

Institution where conference was held

Date(s) of the conference

Sponsor(s) of the conference

If we wish to go one step further, the elements that may be used to identify and describe the individual papers are:

Author of paper
Affiliation of the author
Title of the paper
Number of the paper if papers were numbered
Pagination

When approach is by an element that describes the publication, such as editor, the item can be found with comparative ease because under personal names (with the exception of Shakespeare, the John Smith's and a few others) there is not a large accumulation of entries. When approach is by either the name of the conference or the title of the published proceedings, difficulties arise for a number of reasons.

As noted and illustrated by Chamberlayne and Coblans (22), title pages of conference proceedings are often confusing and misleading. It was noted in Unesco Bulletin for Libraries 1962, p. 172, that the International Organization for Standardization TC/46 was studying the preliminary draft of international recommendations on title pages including symposia. They recommended that the person or persons responsible shall be named; that the title of the publication shall be the same as that of the symposium; if two different titles are necessary, that both be given; that the full name of the main editor or author be given; and that the date, place, and sponsor be given. Scanning the list of ISO standards in the 1966 catalog of the American Standards Association did not reveal any such standard. Many current conference proceedings publications certainly do not seem to follow these recommendations.

Approach by title of conference proceedings is certainly more difficult than title approach for periodicals. The reasons for this may be that the conference title is less clearly shown on the title page, is apt to be cited in various ways in bibliographic citations, and apparently is more difficult to remember. Also, in the case of conferences in a series, the name of the conference and title of the proceedings may change. Additional difficulties may be encountered in divided catalogs. When the proceedings are entered under name of conference, and when the title of the proceedings is the same as the name of the conference, a title added entry may not be made and therefore no entry appears in the title catalog.

The most difficult approach of all is by name of conference. In order to find a conference by name in a catalog, it is necessary, first of all, to remember the beginning word in the name as it has been established in the catalog. In order to find it quickly, all other words in the name must be known. Remembering the exact wording of the name of many conferences is extremely difficult and a rather severe burden to be placed on the users of a catalog. What is usually remembered is the subject of the conference which may, or may not, be remembered in the same terms as those used in the name of the conference. If the remembered subject terms are the same as the subject words in the name, the search will not be any easier because, unfortunately, the subject or keywords in the name appear at the end of the name rather than at the beginning. It is, therefore, not surprising that conferences are difficult to find in a catalog. The situation is very similar to what would be incurred if all personal names were entered under forename rather than surname. In order to find a particular name, the first name would have to be remembered. In order to find a name quickly, the full name as entered in the catalog would also have to be remembered.

Evidence of the desirability of the keywords in the name of the conference as access points is found in the special reference tools for conferences. Proceedings in Print indexes by the keywords in the name of the conference and in the title of the proceedings. (It also provides additional subject access by indexing by the keywords in the titles of the individual papers.) The Index of Conference Proceedings Received by the NLL prepared by the National Lending Library for Science and Technology indexes by the keywords in the titles of conference proceedings. A keyword index is also provided in TMIS Technical Meetings Index. It is also interesting to note that in both Proceedings in Print and in Directory of Published Proceedings the name of the conference is given in inverted order, e.g., Radiocarbon and Tritium Dating, 6th International Conference. The Atomic Energy Commission's KWIC index, Index to Conferences Abstracted by Nuclear Science Abstracts, described by Pflueger (84) is further evidence of the desirability of approach by words other than the first word in the name or title of the conference. The desirability of access by subject is seen in the various tools dealing with conferences and conference proceedings and in the conventional cataloging of them. If, however, the accumulation under subject term is large, the search may still be time consuming. The use of the form subdivision "Congresses" under a subject heading is a way of narrowing a search by subject. However, in conventional cataloging, all the works that may be remembered as conference-like materials (symposia, institutes, etc.) may not qualify as "Congresses" and this subheading may not be applied.

The place where a conference was held, either the city or the institution, may be remembered. The 1949 cataloging code recommended that added entries under place be made for international meetings. The recommendation was not found in the new code. Many libraries make added entries or cross references under the place where the conference was held, and many of the special tools for conferences provide geographic indexes. Library of Congress practice (107) calls for added entries under the institution where the conference was held when this is given in the conference entry. Since there is apt to be a large accumulation of entries under such institutions, this approach may not be simple. Library of Congress practice also calls for added entries under sponsoring bodies. Here again, the same situation of large accumulations of entries under the name is apt to be found.

The date that a conference was held is sometimes known. Many of the special tools for conferences have approach by date. Approach by date is not found in the conventional library catalog, although in the absence of a number for a series of conferences, the date is used to subarrange the entries. At the International Atomic Energy Library (16), a 3 x 5 card file is used to index conferences and meetings. This file is arranged first by geographic location and then by date.

In many special libraries, special files and indexes have been kept manually to retrieve information about conference proceedings. Files including the announcements, programs, lists of attendees, abstracts of papers presented, and preprints of papers are kept by some. It has been suggested by Baum (8) that there be a clearinghouse for scientific and technical meetings. The main areas of responsibility as suggested by Baum would be the organizational and operational problems of meetings. It would seem that if such a clearinghouse were established, information regarding publication of the proceedings of meetings should also be included.

Having considered the problems associated with conferences and also some of the manual methods that are used to help solve them, one might wonder to what extent the new technology is being used to help solve these problems. No doubt a number of applications of machines to conference materials would be found if one could survey the field. No such survey was made by this project, but some of the practices relating to conferences found in the mechanized systems examined by the project are interesting to note. The Cambridge University Philosophical Library (98) is planning a separate conference catalog and separately tags the title of the conference, the number of the conference, the place(s) held, the date(s) held, and the name of the sponsor. MIT's Project Intrex (9) has separately identified,through their relator codes,the name of the sponsor or organizer of the conference and the name of the institution where the conference was held. This system also includes journal articles and other forms of materials and identifies, again through relator codes, the name of the conference at which a paper was presented. It also distinguishes works that are the actual papers presented at the conferences from works that are based upon such papers.

In the comments on conference entries in Section II, it was mentioned that separately identifying the components of a conference entry would provide additional access points for these materials. There are, however, certain limitations in using the name entry as the input source for information about the conference. First, not all conference-like publications have conference name entries, only those which have distinct names. Second, according to conventional cataloging practice, the place where the conference was held is not given in the entry if it is already contained in the name of the conference. Third, the place held is not given if the name of the institution is given. Fourth, the date in the conference entry usually contains only the year. Fifth, the name of the sponsor is not given in the conference name entry.

There are also certain advantages in identifying the work as being the proceedings of a conference. Such tagging allows for special catalogs or lists of conference proceedings arranged either by subject heading or classification number. Such tagging of the record,coupled with the separate identification of the elements of a conference noted above, gives the capability to do coordinate searching using any combination of the following:

Name of conference

Place held

Institution where held

Date held

Sponsors

Subject headings

Classification number

Words in the name of the conference

Words in the title of the proceedings

The above comments relate primarily to conference proceedings published as books and, to a large extent, the treatment they are given in conventional cataloging. Locating conferences in abstracting and indexing journals is also a sizable problem. If the proceedings have been published as books or reports, approach by title of the proceedings or name of the conference is not generally found,because such services do not generally have title indexes,nor do they generally include the name of the conference in their corporate author indexes. (There are certain exceptions to this. Bibliography of Agriculture includes the names of conferences in their organizational index.) The abstracting and indexing services do, however, index separately each paper.

When the papers presented at conferences are published as journal articles,or as separate reports, they will be indexed by the author and subject of the individual papers,but not by name of the conference. The fact that the paper was presented at a conference is customarily given in a note in the report abstracting journals.

VIII. DATA ELEMENTS -- GENERALIZED REPRESENTATION

Trying to find an arrangement that is not biased towards a particular bibliographic form, a particular processor, or a particular kind of record is not easy. Some ideal universal scheme may reveal itself after large networks have been designed and operated which include input from various sources, all bibliographic forms, and all kinds of records. The best plan that could be found at this time was to view bibliographic records as consisting of: (1) the name (title) of the work, (2) the other names, dates, and numbers associated with the work and (3) additional bibliographical, physical and subject analysis of the work. The names associated with the work can be the names of individuals, groups of individuals, places, and things as well as the names (titles) of related works. Numbers or codes can refer to any number identifying the work or part of the work. This results in an initial breakdown as follows:

Name (title)of the work

- Names of persons associated with the work
- Names of corporate bodies associated with the work
- Names of places associated with the work
- Names of things associated with the work
- Other related works
- Dates associated with the work
- Numbers or codes associated with the work

- Serial characteristics
- Form of the work (bibliographical and physical)
- Physical features
- Bibliographical contents or features
- Subject content
- Type of work reported
- Level of work
- Evaluation of work
- Purchasing information

The first group - names, dates, and numbers - are common to most records. They identify the work and may be considered as answering the questions - who, what, when, and where. The second group are less commonly found, often peculiar to one particular type of record or type of processor. In the conventional scheme, the elements in the second group are included in notes. Since there would be little difference in their representation in either the conventional or this generalized scheme they are not repeated here.

In addition to indicating that a data element is the name of a person, the name of a corporate body or a title, further identification may be required in manipulating and processing machine readable bibliographic records. This additional identification is discussed here under the headings components, qualifiers, types, and relationships.

Components

The data elements listed above can be broken down into smaller parts. The title can be broken down under certain conditions into the part required for an added entry and the subtitle. Personal names can be broken down into surnames and forenames; corporate names can be broken down into main body and subdivisions. Place names can be broken down to city, state, county; names of things (subjects) into main term and subheadings. Related works contain the elements necessary to describe the work. Dates can be divided into month, day and year; numbers or codes can contain the appropriate designation, e.g., vol., v., no., etc., as well as the actual number.

Qualifiers

Machine processing may also require additional qualifying information about the data elements that point out particular characteristics about them such as:

Language of the element

Alphabet of the element

Security classification of the element

Authority for the element (e.g., Library of Congress, National Library of Medicine, or COSATI)

If the element is in coded or natural language form

If the element is a translation, did it appear on the piece or was it supplied by the processor

If the element is a transliteration, did it appear on the piece or was it supplied by the processor

Some of the above qualifiers pertain to particular elements but not to others. Security classification, for example, pertains to the title of the document but not to the personal names associated with the document. Also,more than one qualifier may be required for one data element.

Types

Although the basic list does distinguish between data elements to a certain extent, further distinction may be necessary in a system. For example, it may be desirable to distinguish between different types of corporate and personal names. There are many different kinds of numbers that can be associated with a work such as:

Series number

Volume number

  Beginning
  Ending

Issue number

  Beginning
  Ending

Part number

Supplement number

Edition number

  Beginning
  Ending

Page number

  Beginning
  Ending

Abstract number

National Bibliography number

Library of Congress card number

Registration number

Luhn number

Superintendent of Document number

Contract number

Project number

Task number

Document serial number

Originating agency report number

Monitoring agency report number

Document distributing agency number

Secondary numbers

Serial identification of a phonorecord

Patent number

Relationships

As Simonton (93) points out, relationships in conventional cataloging have been indicated on the catalog card explicitly, implicitly, and tacitly. The relationships of joint authors, editors, translators, and illustrators have been indicated for personal names explicitly in the name heading by the use of ed., tr., etc., after the name. The relationship of main entry and publisher are shown implicitly by the positioning of the data on the card. Other relationships are indicated tacitly in the wording of the author statement, edition statement,and notes.

There is no explicit indication of relationships for corporate names. The relationships, author and publisher, have been shown implicitly in the main entry and imprint statement. Other relationships for corporate names may be more precisely stated in notes.

The relationships of other works to the work being processed are usually given tacitly in a note. The relationships of names to works may also be shown in the name of the separate index or catalog, e.g., author, title, subject.

Personal and Corporate Names

In most of the existing mechanized systems the identification is by relationship, e.g., author, publisher, etc. Some of the systems have then further identified the type of author -- personal or corporate. The presentation here is first by type of name, and then by relationship. The same result can be achieved either way. It seemed, however, that when other bibliographic forms are studied and new relationships discovered, the additions may be accommodated more conveniently in this scheme. Also different types of names may have the same relationship.

The separate listing of relationship does not necessarily mean that the project has found strong reasons why each needs to be separately identified. In all citations there is a certain amount of implicit and sometimes even explicit indication of relationships. Simonton has questioned the need to justify entries with notes, which is really questioning the need to show the relationship of entries to works. Very little indication of relationships was found in the systems examined. Author and publisher are usually given but little else. The Cambridge Philosophical Library (98) does input separately the following elements:

Author
Editor
Translator
Person honored
Corporate author
Conference
Publisher
Sponsor

In the M. I. T. Augmented Catalog (9), detailed relator codes are given for personal authors, corporate authors, and publishers as follows:

Personal Names Relator Codes

Joint author
Editor
Compiler
Translator
Illustrator
Forworder
Prefacer
Introducer
Translation editor
Series editor
Editor-in-chief
Adaptor or condensor or as told to
Thesis supervisor
Note writer
Reviser
Narrator, reader
Ghost writer
Inventor
Patent assignee
Photographer

Corporate Name Relator Codes

Paper presented at this conference
Thesis submitted to this institution
Based upon a paper presented at this conference
Based upon a thesis submitted to this institution
Sponsor or organizer of a conference
Non-sponsoring organization at which a conference was held
(Any personal name relator code can also be used with a corporate name)

Non-Publisher Relator Codes

Distributor
Issuing agency
Printer
Publisher for

The concept of function as proposed by Bregzis (13) may be akin to the concept of relationship.

The relationship of a name to a work may be required if bibliographic citations are to be generated from the input data. If the input for a conventional catalog were to be used to create a bibliographic citation in which the authors names were to appear first in the citation, problems would be encountered in certain instances, notably those of shared or multiple authorship. If the authors names were taken from the main and added entries, the relationship of the entries must be known, otherwise translators, illustrators, etc., could be listed as joint authors. If the authors' names for the citation were taken from the author statement of the input, there again would be problems because names should be inverted. Also one does not really know what kind of information is in the author statement. It can also pertain to editors, translators, or illustrators.

Since the number of entries under a personal name is not apt to be large, the need to distinguish the different relationships of personal names is not great. Under corporate names, however, the accumulation of entries may be very large. In such cases the capability of narrowing a search by relationship can be advantageous. If it were known that a conference was held at the University of Illinois, the ability to retrieve only the records in which the institution was the place where a conference was held would facilitate the search.

The relationship of the name to the work is needed if the citation or descriptive cataloging of the work is to be generated from the same input as the index entries. Names of translators should be distinguished from names of authors so that the appropriate words, e.g., "translated by", may be generated by the computer. This results in a highly formalized description, and one which certainly is not acceptable in conventional cataloging which requires descriptive cataloging to be in the words of the author or publisher. In other processing, e.g., reports cataloging, it is acceptable.

Works to Works

In addition to the names, etc., associated with a particular work, a record may contain a description of another work which is in some way related to the work. In conventional cataloging, a record for one edition of a work may contain details of other editions of that work; a record for a serial title may contain the titles of serials superceded by the work being processed; a record for a sequel may contain details of the original; the record for a work that is a criticism of another work may contain identifying details of the work criticised; the record for a collective work may contain the descriptions of the individual papers or parts that make up the collective work; and the record for a monograph that is a monograph in series will contain the title of series. The information concerning the related works is given in notes, with entries made in certain cases.

The traditionalist is not apt to see much, if any, similarity in the records mentioned above. If viewed from the standpoint of the elements contained in the records, however, they are similar. They each contain the elements such as title, names, dates, etc., which identify the work being processed plus elements, title, etc., that describe or identify the related work. The difference is in the relationship between the works. In some cases the work is related to another because it is part of the other work; in other cases, because it is another edition or the subject of the work. Other processors may be dealing with relationships between works that are not encountered in conventional cataloging. For example, a citation index deals with the relationship between cited and citing works. In a serials data clearinghouse the abstracting or indexing journals which abstract or index the serial being processed would be desirable information.

Lang (65) in his processing scheme brought out the relationships between a work in a series and the series as a whole. M.I.T.'s Augmented Catalog indicates the relationships between different language editions of a work and between the different physical forms of a work.

If one were to list the various related works that might exist for a work being processed, it might look something like the following:

- Editions (Revisions)

    - Original
    - Other (2d, 3d, revised)

- Editions (Language)

    - Original
    - Other

Editions (Physical form)

- Hardcopy
- Microform
- Recording (e.g., Talking book)
- Reprint
- Photoreproduction

Editions (Bibliographical form, e.g., a work issued first as a report, later as a journal article or book)

- Book
- Journal article
- Periodical issue
- Report

Predecessors

- "Absorbs"
- "Continues"
- "Supersedes"

Successors

- "Absorbed by"
- "Continued by"
- "Superseded by"

Sequels

Abridgements

Adaptations

Dramatizations

Parodies

Concordances

Supplements

Indexes

Abstracts

Reviews

Larger work which contains work being processed

- Series title
- Periodical (containing journal article)
- Book (collective work containing the individual contribution)

Smaller works contained in the work being processed

- Journal article
- Chapter, volume, or part of a book
- A number in a series

Subject of a work

- Commentaries
- Criticisms

Works citing the work being processed

Works cited by the work being processed

The description of the related work may contain any or all of the elements used to describe the work being processed, namely:

- Title
- Personal names
- Corporate bodies
- Places
- Dates
- Numbers or codes

In additon to the elements and the relationship, the description of the related work would also contain the type of work, e.g.,book, journal article, etc.

Dates to Work

Many dates can be associated either with the work or with other elements in the record for the work. Some of these include:

Imprint date
Date issued or published
Date revised
Date copyrighted
Date of original edition
Date of reprint edition
Date(s) publication suspended
Date manuscript received
Priority date (patents)
Date of execution (music)
Date of degree (thesis)
Author's birth date
Author's death date
Dates author flourished
Date corporate body founded
Date(s) of conference

Many of the local data elements can also fit into this scheme, e.g., names of catalogers or requestors, dates ordered, received, etc. Although the scheme is far from perfect and would require much thinking to refine it adequately, it does help to illustrate analytically "what little records are made of".

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IX. LOCAL DATA ELEMENTS

The Special Project on Data Elements was to concern itself with elements of general interest and exclude those of local interest. Since "general" and "local" were not defined by the Subcommittee, the local elements found in the systems studied are listed here in case any of them should have been considered general rather than local. For example, one might question whether the name of the library, the first item in this list, is of local interest when it is used in a union list of holdings. It is also questionable whether the call number, when it is the Library of Congress call number, is of local or general interest. No attempt has been made to order the elements in any fashion.

This list may also serve as a checklist for those engaged in systems design.

- Library
  - Name
  - Code
  - Street
  - City
  - State or province
  - Country
  - Lending/copying policy
  - Branch name(s)
  - Branch code(s)
- Location in library
- Call number
  - Classification number
    - Line 1
    - Line 2
    - etc.
  - Book number
    - Line 1
    - Line 2
    - etc.
  - Authority
    - Library of Congress
    - etc.

- Copy number
- Shelf arrangement code
  - Under title
  - Under personal author
  - Under corporate author
  - Under course number
  - Under department (theses)
- Number of copies ordered
- Number of copies received
- Number of copies owned
- Accession number
- Physical form of holdings
  - Bound
  - Unbound
  - Microfilm
  - etc.
- Volumes bound, unbound, microfilmed
- Volumes missing from shelf
- Holdings
  - Beginning issue designation
    - Volume number
    - Issue number
    - Month
    - Day
    - Year
    - Edition number
  - Ending issue designation
    - Volume number
    - Issue number
    - Month
    - Day
    - Year
    - Edition number
  - Summary holdings statement
  - Retention statement
    - Indefinite
    - Current issue
    - Number of months held
    - Number of issues held
    - Number of years held
    - etc.
  - Treatment when discarded
    - Destroyed
    - Forwarded to
  - If holdings complete
- If cataloged or not
- If subtitle included in holdings record title or check-in title
- If series analyzed separately
- If series classed separately
- If contents analyzed
- Catalog authority for work

Catalog authority for entry
Instructions for catalogers
Short title (check-in)
If index is treated as separate title (cataloging,
  holdings, check-in, binding)
If on order
If currently received
Type of order
  Gift
  Standing Order
  On approval
  etc.
Membership number
If replacement copy
If back set
Vendor
  Name
  Code
  Street
  City
  State or province
  Country
Publisher's catalog number
Mailing address if different from main library
Searcher's report
Requestor's
  Name
  Department
Recommended by code
  Librarian
  Faculty member
  Non-student advanced researcher
  Graduate student
  Librarian in consultation with faculty or researcher
  Librarian in consultation with graduate searcher
Date ordered
Date renewed
Date received
Invoice date
Date payment approved
Date paid
Purchase order number
Invoice number
Fund name
Fund number
Dealer report codes
Notes (instructions) for dealers
Department or school
Donor
  Name
  Code

Cost
Amount of discount
Additional billings
Cost previous years
If paid with another title
Volume number(s) ordered
Volume number(s) received
Issue number(s) ordered
Issue number(s) received
Length of subscription
  1 year
  2 years
  etc.
  Till forbid
Date current subscription started
Expiration date
Time period prior to expiration date, item renewed
Number of issues per subscription
Source of sample issue
If decided not to purchase title
Price of what is exchanged
If exchange rejected
How mailed
Shipping instructions
Claiming source
  Name
  Code
  Street
  City
  State or province
  Country
Number of days between arrivals
Number of days allowed before claiming
Months (weeks or days) received before or after publication date
Expected arrival date
If bound
If microfilmed
If use publisher's binding
Class of binding
Rub number
Color of binding
Treatment of ads
  Remove all
  Bind all
  Last copy only
  As attached instructions
Treatment of covers
  Remove all
  Bind in front
  Bind all
  Bind as indicated

- Treatment of editorials (in or out)
- Treatment of index
  - In front
  - In back
  - Stub for index
- Treatment of supplements
- Special instructions for title
- When bound (microfilmed)
  - Volume complete
  - Year complete
  - Issue within volume or year
  - Period of time after completion
- Month of completion of volume
- Number of years bound together
- Number of issues bound together
- Spine information
  - Title
    - 1st line
    - 2d line
    - etc.
  - Beginning issue designation
    - Volume number
    - Issue number
    - Abstract number
    - Page number
    - Part number
    - Month
    - Day
    - Year
  - Ending issue designation
    - Volume number
    - Issue number
    - Abstract number
    - Page number
    - Part number
    - Month
    - Day
    - Year
  - If spine title is lengthwise
- Binder's
  - Name
  - Code
  - Street
  - City
  - State or province
  - Country
- Date sent to bindery
- Date returned from bindery
- Bookplate information
- Year of last bound volume

Latest index received (month of issue)
If routed
If table of contents xeroxed
Recipients' names
Recipients' locations
If circulating
Borrower's name
Borrower's number
Borrower's address
Borrower's telephone number
Qualifying contract number of requestor
Date borrowed
Date due
Date renewed
Date returned
Date destroyed

APPENDIX
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APPENDIX B

INTERVIEWS

September 27, 1966
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.
Dr. M. M. Kessler (Associate Director of Libraries)

September 28, 1966
INFORONICS, INC., CAMBRIDGE, MASS.
Mr. Lawrence F. Buckland (President)
Mr. William R. Nugent (Vice President)

October 14, 1967
INSTITUTE FOR SCIENCE INFORMATION, PHILADELPHIA, PA.
Mr. Irving H. Sher (Director of Research)
(Interview conducted at the USASI meeting)

November 9, 1966
F. W. FAXON CO., HYDE PARK, MASS.
Mr. Frank F. Clasquin (Vice President)
Mr. Samuel Lehane (Data Processing Manager)

November 10, 1966
AVCO RESEARCH AND DEVELOPMENT DIVISION, WILMINGTON, MASS.
Mr. Maurice Rahilly (Information Specialist)
Mr. Paul Mulloney (Group Leader, Research Library)

November 15, 1966
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, ELECTRONICS RESEARCH CENTER, CAMBRIDGE, MASS.
Miss Adelaide A. Del Frate (Librarian)
Mr. Richard J. Talbot (Cataloger)

November 17, 1966
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, SCIENTIFIC AND TECHNICAL INFORMATION DIVISION, COLLEGE PARK, MD.
Mr. Philip F. Eckert (Chief of the Machine Searches Branch)
Mr. R. C. Martin (Manager of the Reference Department)
Mr. Charles W. Hargrave (Research and Analysis Section, Information Services Branch)

November 18, 1966
CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, SPRINGFIELD, VA.
Mrs. Eleanor J. Aronson (Documents Standards Section)

November 18, 1966
DEFENSE DOCUMENTATION CENTER, ALEXANDRIA, VA.
Mr. Paul Klinefelter (Assistant Director of Technical Processing)
Mr. Myer D. Kahn (Chief, Accessions Division)

November 21, 1966
NATIONAL LIBRARY OF MEDICINE, BETHESDA, MD.
Mr. James Riley (Chief, Technical Services Division)
Mr. Sal Costabile
(Special Assistant to the Chief of the Technical Services Division)
Miss Emily Wiggins (Head, Cataloging Section)
Mr. Constantine Gillespie (Head, Index Section)

November 21, 1966
U. S. ATOMIC ENERGY COMMISSION, GERMANTOWN, MD.
Mr. Abraham Lebowitz (Deputy Librarian)

November 22, 1966
LIBRARY OF CONGRESS, WASHINGTON, D.C.
Mr. Marvin W. MacFarland (Chief, Science and Technology Division)
Mr. David Sparks (Head, Reference and Library Services Section)

November 30, 1966
HARVARD UNIVERSITY LIBRARY, CAMBRIDGE, MASS.
Mr. Foster M. Palmer (Associate University Librarian)

November 30, 1966
SIMMONS COLLEGE, SCHOOL OF LIBRARY SCIENCE, BOSTON, MASS.
Miss Laura C. Colvin (Professor of Library Science)
Miss Mary R. Kinney (Associate Professor of Library Science)

December 7, 1966
NATIONAL LIBRARY OF MEDICINE, BETHESDA, MD.
Mr. James Riley (Chief, Technical Services Division)
Mr. Sal Costabile (Special Assistant to the Chief of the Technical Services Division)
Miss Elizabeth Sawyer (Head, Acquisitions Section)

December 8, 1966
LIBRARY OF CONGRESS, WASHINGTON, D.C.
Mrs. Elaine Woods (Information Systems Research Analyst, Information Systems Office)
Mr. Samuel Lazerow (Chief, Serial Records Division)
Mr. Paul Vassallo (Assistant Chief, Serial Records Division)

December 9, 1966
NATIONAL AGRICULTURE LIBRARY, WASHINGTON, D.C.
Miss Bella Shachtman (Assistant Director, Technical Services)
Mr. Ljubo Lulich (Assistant Director, Field and Special Services)
Mr. John Forbes (Chief, Division of Indexing and Documentation
Mrs. Jean Holmes (Chief, Division of Catalog and Records)

January 4, 1967
SIMMONS COLLEGE, SCHOOL OF LIBRARY SCIENCE, BOSTON, MASS.
Miss Laura C. Colvin (Professor of Library Science)

January 6, 1967
CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO
Mr. James Wood (Head Librarian)
Mrs. Arlene Somerville (Editor,"Comprehensive List of Periodicals for Chemistry and Chemical Engineering")
(Telephone Interview)

January 13, 1967
LIBRARY OF CONGRESS, WASHINGTON, D.C.
Mrs. Lucia Rather (Senior Information Systems Research Analyst, Information Systems Office)

January 25, 1967
HARVARD UNIVERSITY LIBRARY, CAMBRIDGE, MASS.
Mr. Foster M. Palmer (Associate University Librarian)
Miss Susan M. Haskins (Associate University Librarian for Cataloging)

January 27, 1967
NATIONAL LIBRARY OF MEDICINE, BETHESDA, MD.
Mr. James Riley (Chief, Technical Services Division)
Miss Emily Wiggins (Head, Cataloging Section)
Miss Elizabeth Sawyer (Head, Acquisitions Section)

January 30, 1967
NATIONAL AGRICULTURE LIBRARY, WASHINGTON, D.C.
Miss Bella Shachtman (Assistant Director, Technical Services)
Mrs. Jeanne Holmes (Chief, Division of Catalog and Records)

January 31, 1967
SIMMONS COLLEGE, SCHOOL OF LIBRARY SCIENCE, BOSTON, MASS.
Miss Mary R. Kinney (Associate Professor of Library Science)

February 3, 1967
UNIVERSITY OF TORONTO LIBRARY, TORONTO, CANADA
Mr. Ritvars Bregzis (Assistant Librarian, Technical Services)
Mr. Donald A. Smith (Head, Serials Department)
Mrs. Susan Merry (Head,ONULP Technical Services)

February 6, 1967
NEW YORK PUBLIC LIBRARY, NEW YORK, N.Y.
Mr. Joseph A. Rosenthal (Chief, Preparation Services)

February 6, 1967
YALE UNIVERSITY LIBRARY, NEW HAVEN, CONN.
Mr. Frederick G. Kilgour
(Associate Librarian for Research and Development)
Mrs. Vera Barry (Head, Catalogue Department)

February 7, 1967
COLUMBIA UNIVERSITY LIBRARIES, NEW YORK, N.Y.
Mr. Paul J. Fasana (Assistant to the Director for Library Systems)

February 14, 1967
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, PROJECT INTREX, CAMBRIDGE, MASS.
Mr. Alan R. Benenfeld
(Supervisor of the Augmented Catalog Input Group)

February 15, 1967
Miss Barbara Spence, Editor Proceedings in Print
Telephone Interview